H1568

0057399

Date: 6 December 2001
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200 Area Source Characterization 200-CS-1 Operable Unit - Waste Management
Subject: Semivolatile - Data Package No. H1568-LLI (SDG No. H1568)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H1568-LLI prepared by Lionville Laboratory, Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
B13C81	10/30/01	Soil	C	Semivolatiles by 8270C

Data validation was conducted in accordance with the BHI validation statement of work and the *Sampling and Analysis Instruction for the 216-A-29 Ditch for Project W-211,* BHI-01562, Rev. 0, October 2001. Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

- **Holding Times**

  Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Water samples must be extracted within 7 days of the date of sample collection and analyzed within 40 days from the date of extraction.

  If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two

times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were met.

- **Method Blanks**

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the project quantitation limit (PQL) and is less than five times (or less than ten times for lab contaminants) the highest associated blank result, the sample result value is raised to the PQL level and qualified as undetected "U".

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis, therefore, no field blank data was available for review.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

All MS/MSD results were acceptable.

Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the PQL are qualified as estimates and flagged "J". Sample results less than the PQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the PQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

All surrogate recoveries were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-35%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All precision results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the BHI-01562, Rev. 0, *Sampling and Analysis Instruction for the 216-A-29 Ditch for Project W-211,* October 2001 PQLs to ensure that laboratory detection levels meet the required criteria. All undetected analytes exceeded the PQL with the exception of tributylphosphate. Under the BHI statement of work, no qualification is required.

- **Completeness**

Data package No. H1568-LLI was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

All undetected analytes exceeded the PQL with the exception of tributylphosphate. Under the BHI statement of work, no qualification is required.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

BHI-01562, Rev. 0, *Sampling and Analysis Instruction for the 216-A-29 Ditch for Project W-211,* October 2001.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the BHI validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the same quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H1568	REVIEWER: TLI	DATE: 12/6/01	PAGE 1 OF 1
COMMENTS: No qualifiers assigned.			

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

SEMIVOLATILE/PAH ANALYSIS, SOIL MATRIX, (UG/KG) Page__1__ of__2__

Project: BECHTEL-HANFORD															
Laboratory: LLI															
Case:	SDG: H1568														
Sample Number		B13C81													
Remarks															
Sample Date		10/30/01													
Extraction Date		11/5/01													
Analysis Date		11/16/01													
Semivolatile (8270C)	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	330	400	U												
bis(2-Chloroethyl)ether	330	400	U												
2-Chlorophenol	330	400	U												
1,3-Dichlorobenzene	330	400	U												
1,4-Dichlorobenzene	330	400	U												
1,2-Dichlorobenzene	330	400	U												
2-Methylphenol	330	400	U												
2,2-Oxybis(1-chloropropane)	330	400	U												
4-Methylphenol	330	400	U												
N-Nitroso-di-n-propylamine	330	400	U												
Hexachloroethane	330	400	U												
Nitrobenzene	330	400	U												
Isophorone	330	400	U												
2-Nitrophenol	660	400	U												
2,4-Dimethylphenol	330	400	U												
bis(2-Chloroethoxy)methane	330	400	U												
2,4-Dichlorophenol	330	400	U												
1,2,4-Trichlorobenzene	330	400	U												
Naphthalene	330	400	U												
4-Chloroaniline	330	400	U												
Hexachlorobutadiene	330	400	U												
4-Chloro-3-methylphenol	330	400	U												
2-Methylnaphthalene	330	400	U												
Hexachlorocyclopentadiene	330	400	U												
2,4,6-Trichlorophenol	330	400	U												
2,4,5-Trichlorophenol	330	1000	U												
2-Chloronaphthalene	330	400	U												
2-Nitroaniline	330	1000	U												
Dimethylphthalate	330	400	U												
Acenaphthylene	330	400	U												
2,6-Dinitrotoluene	330	400	U												

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Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results. All other qualifiers shown were applied during validation.

SEMIVOLATILE/PAH ANALYSIS, SOIL MATRIX, (UG/KG) Page__2__ of__2__

Project: BECHTEL-HANFORD															
Laboratory: LLI															
Case:	SDG: H1568														
Sample Number		B13C81													
Remarks															
Sample Date		10/30/01													
Extraction Date		11/5/01													
Analysis Date		11/16/01													
Semivolatile (8270C)	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline	330	1000	U												
Acenaphthene	330	400	U												
2,4-Dinitrophenol	825	1000	U												
4-Nitrophenol	660	1000	U												
Dibenzofuran	330	400	U												
2,4-Dinitrotoluene	330	400	U												
Diethylphthalate	330	400	U												
4-Chlorophenyl-phenyl ether	330	400	U												
Fluorene*	330	400	U												
4-Nitroaniline	330	1000	U												
4,6-Dinitro-2-methylphenol	330	1000	U												
N-Nitrosodiphenylamine	330	400	U												
4-Bromophenyl-phenyl ether	330	400	U												
Hexachlorobenzene	330	400	U												
Pentachlorophenol	330	1000	U												
Phenanthrene	330	150													
Anthracene	330	400	U												
Carbazole	330	400	U												
Di-n-butylphthalate	330	220													
Fluoranthene	330	120													
Pyrene + A21	330	99													
Butylbenzylphthalate	330	400	U												
3,3'-Dichlorobenzidine	330	400	U												
Benzo(a)anthracene	330	34													
Chrysene	330	40													
bis(2-Ethylhexyl)phthalate	330	400	U												
Di-n-ootylphthalate	330	400	U												
Benzo(b)fluoranthene	330	37													
Benzo(k)fluoranthene	330	400	U												
Benzo(a)pyrene	330	22													
Indeno(1,2,3-od)pyrene	330	400	U												
Dibenz(a,h)anthracene	330	400	U												
Benzo(g,h,i)perylene	330	400	U												
Tributylphosphate	3300	400	U												

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results. All other qualifiers shown were applied during validation.

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, Special List — Report Date: 11/19/01 13:36

RFW Batch Number: 0111L256 — Client: TMU-HANFORD B02-008 — Work Order: 11343606001 — Page: 1a

	Cust ID:	B13C81	B13CK9	B13CK9	B13CK9	SBLKJD	SBLKJD BS
Sample Information	RFW#:	001	002	002 MS	002 MSD	01LL1329-MB1	01LL1329-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	5.00	5.00	5.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	Nitrobenzene-d5	86 %	85 %	86 %	94 %	93 %	114 %
	2-Fluorobiphenyl	76 %	98 %	99 %	98 %	87 %	99 %
	p-Terphenyl-d14	103 %	115 %	101 %	105 %	123 %	134 %
	Phenol-d5	88 %	73 %	73 %	77 %	90 %	107 %
	2-Fluorophenol	81 %	70 %	69 %	72 %	90 %	97 %
	2,4,6-Tribromophenol	75 %	55 %	52 %	66 %	89 %	112 %
Phenol		400 U	2600 U	71 %	74 %	330 U	92 * %
bis(2-Chloroethyl)ether		400 U	2600 U	2600 U	2600 U	330 U	330 U
2-Chlorophenol		400 U	2600 U	80 %	86 %	330 U	97 %
1,3-Dichlorobenzene		400 U	2600 U	2600 U	2600 U	330 U	330 U
1,4-Dichlorobenzene		400 U	2600 U	80 %	84 %	330 U	80 %
1,2-Dichlorobenzene		400 U	2600 U	2600 U	2600 U	330 U	330 U
2-Methylphenol		400 U	2600 U	2600 U	2600 U	330 U	330 U
2,2'-oxybis(1-Chloropropane)		400 U	2600 U	2600 U	2600 U	330 U	330 U
4-Methylphenol		400 U	2600 U	2600 U	2600 U	330 U	330 U
N-Nitroso-Di-n-propylamine		400 U	2600 U	104 %	112 %	330 U	121 %
Hexachloroethane		400 U	2600 U	2600 U	2600 U	330 U	330 U
Nitrobenzene		400 U	2600 U	2600 U	2600 U	330 U	330 U
Isophorone		400 U	2600 U	2600 U	2600 U	330 U	330 U
2-Nitrophenol		400 U	2600 U	2600 U	2600 U	330 U	330 U
2,4-Dimethylphenol		400 U	2600 U	2600 U	2600 U	330 U	330 U
bis(2-Chloroethoxy)methane		400 U	2600 U	2600 U	2600 U	330 U	330 U
2,4-Dichlorophenol		400 U	2600 U	2600 U	2600 U	330 U	330 U
1,2,4-Trichlorobenzene		400 U	2600 U	75 %	81 %	330 U	79 %
Naphthalene		400 U	2600 U	2600 U	2600 U	330 U	330 U
4-Chloroaniline		400 U	2600 U	2600 U	2600 U	330 U	330 U
Hexachlorobutadiene		400 U	2600 U	2600 U	2600 U	330 U	330 U
4-Chloro-3-methylphenol		400 U	2600 U	81 %	86 %	330 U	104 * %
2-Methylnaphthalene		400 U	2600 U	2600 U	2600 U	330 U	330 U
Hexachlorocyclopentadiene		400 U	2600 U	2600 U	2600 U	330 U	330 U
2,4,6-Trichlorophenol		400 U	2600 U	2600 U	2600 U	330 U	330 U
2,4,5-Trichlorophenol		1000 U	6400 U	6400 U	6400 U	830 U	830 U

*= Outside of EPA CLP QC limits.

RFW Batch Number: 0111L256 Client: TMU-HANFORD B02-008 Work Order: 11343606001 Page: 1b

Cust ID:	B13C81		B13CK9		B13CK9		B13CK9		SBLKJD		SBLKJD BS	
RFW#:	001		002		002 MS		002 MSD		01LE1329-MB1		01LE1329-MB1	
2-Chloronaphthalene	400	U	2600	U	2600	U	2600	U	330	U	330	U
2-Nitroaniline	1000	U	6400	U	6400	U	6400	U	830	U	830	U
Dimethylphthalate	400	U	2600	U	2600	U	2600	U	330	U	330	U
Acenaphthylene	400	U	2600	U	2600	U	2600	U	330	U	330	U
2,6-Dinitrotoluene	400	U	2600	U	2600	U	2600	U	330	U	330	U
3-Nitroaniline	1000	U	6400	U	6400	U	6400	U	830	U	830	U
Acenaphthene	400	U	2600	U	98	%	100	%	330	U	94	%
2,4-Dinitrophenol	1000	U	6400	U	6400	U	6400	U	830	U	830	U
4-Nitrophenol	1000	U	6400	U	92	%	85	%	830	U	105	%
Dibenzofuran	400	U	2600	U	2600	U	2600	U	330	U	330	U
2,4-Dinitrotoluene	400	U	2600	U	83	%	89	%	330	U	105 *	%
Diethylphthalate	400	U	2600	U	2600	U	2600	U	330	U	330	U
4-Chlorophenyl-phenylether	400	U	2600	U	2600	U	2600	U	330	U	330	U
Fluorene	400	U	2600	U	2600	U	2600	U	330	U	330	U
4-Nitroaniline	1000	U	6400	U	6400	U	6400	U	830	U	830	U
4,6-Dinitro-2-methylphenol	1000	U	6400	U	6400	U	6400	U	830	U	830	U
N-Nitrosodiphenylamine (1)	400	U	2600	U	2600	U	2600	U	330	U	330	U
4-Bromophenyl-phenylether	400	U	2600	U	2600	U	2600	U	330	U	330	U
Hexachlorobenzene	400	U	2600	U	2600	U	2600	U	330	U	330	U
Pentachlorophenol	1000	U	6400	U	41	%	45	%	830	U	101	%
Phenanthrene	150	J	370	J	250	J	290	J	330	U	330	U
Anthracene	400	U	2600	U	2600	U	2600	U	330	U	330	U
Carbazole	400	U	2600	U	2600	U	2600	U	330	U	330	U
Di-n-Butylphthalate	220	J	2700		2600		4800		330	U	20	J
Fluoranthene	120	J	370	J	290	J	380	J	330	U	330	U
Pyrene	99	J	350	J	92	%	105	%	330	U	114	%
Butylbenzylphthalate	400	U	290	J	830	J	420	J	330	U	330	U
3,3'-Dichlorobenzidine	400	U	2600	U	2600	U	2600	U	330	U	330	U
Benzo(a)anthracene	34	J	180	J	240	J	330	J	330	U	330	U
Chrysene	40	J	210	J	280	J	330	J	330	U	330	U
bis(2-Ethylhexyl)phthalate	400	U	6200		4800		8100		330	U	20	J
Di-n-Octyl phthalate	400	U	2600	U	2600	U	2600	U	330	U	330	U
Benzo(b)fluoranthene	37	J	240	J	310	J	350	J	330	U	330	U
Benzo(k)fluoranthene	400	U	2600	U	2600	U	2600	U	330	U	330	U
Benzo(a)pyrene	22	J	160	J	230	J	300	J	330	U	330	U
Indeno(1,2,3-cd)pyrene	400	U	2600	U	2600	U	2600	U	330	U	330	U
Dibenzo(a,h)anthracene	400	U	2600	U	2600	U	2600	U	330	U	330	U
Benzo(g,h,i)perylene	400	U	2600	U	2600	U	2600	U	330	U	330	U
Tributylphosphate	400	U	310	J	580	J	660	J	330	U	330	U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

12/3/01

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LVLI
LIONVILLE LABORATORY INC.

Client: TNU-HANFORD B02-008
LVL #: 0111L256
SDG/SAF #: H1568, H1571/B02-008

W.O. #: 11343-606-001-9999-00
Date Received: 11-02-2001

SEMIVOLATILE

Two (2) soil samples were collected on 10-30,31-2001.

The samples and their associated QC samples were extracted on 11-05-2001 and analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8270C for TCL and Tributylphosphate Semivolatile target compounds on 11-16-2001.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. The cooler temperatures upon receipt have been recorded on the chain-of-custody.
2. Samples were extracted and analyzed within required holding time.
3. Non-target compounds were detected in the samples.
4. Sample B13CK9 and its associated matrix spike samples required a 5-fold dilution due to high levels of both target and non-target compounds.
5. All surrogate recoveries were within EPA QC limits.
6. Four (4) of twenty-two (22) blank spike recoveries were outside EPA QC limits.
7. All matrix spike recoveries were within EPA QC limits.
8. Internal standard area and retention time criteria were met.
9. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

J. Michael Taylor
President
Lionville Laboratory Incorporated

11/21/01
Date

som\gcmsp\data\bna\tnu-hanford-0111-256.doc

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

Lionville Laboratory, Inc.
BNA ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B02-008

DATE RECEIVED: 11/02/01 LVL LOT # :0111L256

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B13C81	001	S	01LE1329	10/30/01	11/05/01	11/16/01
B13CK9	002	S	01LE1329	10/31/01	11/05/01	11/16/01
B13CK9	002 MS	S	01LE1329	10/31/01	11/05/01	11/16/01
B13CK9	002 MSD	S	01LE1329	10/31/01	11/05/01	11/16/01
LAB QC:						
SBLKJD	MB1	S	01LE1329	N/A	11/05/01	11/16/01
SBLKJD	MB1 BS	S	01LE1329	N/A	11/05/01	11/16/01
SBLKJD	MB1 BSD	S	01LE1329	N/A	11/05/01	11/16/01

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B02-008-01 | Page 1 of 1

...tor: ...mas, G/Watson, D	Company Contact: Cearlock, CS	Telephone No. 372-9638	Project Coordinator: TRENT, SJ
...ct Designation: ...Area Source Characterization 200-CS-1 OU - Waste Mana	Sampling Location: 200 East & West		SAF No. B02-008
...hest No. See OSPC	Field Logbook No. EL-1551	COA XL2002CHGR	Method of Shipment: Fed Ex
...ed To ...RECRA	Offsite Property No. A00018 A/A DSW 10/30/01		Bill of Lading/Air Bill No. SEE OSPC A/A DSW 10/30/01

Price Code 8N 8K | Data Turnaround ~~45 Days~~ 15 Day

Air Quality ☐

...SIBLE SAMPLE HAZARDS/REMARKS

TIE TO B13C84

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 10/30/01. Collector not available to relinquish samples on 11/1/01 for shipment. RT 11-1-01

SAMPLE ANALYSES

Preservation			None	None	Cool 4C	Cool 4C	Cool 4C	None	Cool 4C	None	
Type of Container			aG	aG	aG	aG	aG	aG	aG	aG	
No. of Container(s)			1	1	1	1	1	1	1	1	
Volume			~~1000mL~~	500mL	1000mL	1000mL	120mL	60mL	120mL	120mL	
			~~See Item (1) in Special Instructions.~~ DSW 10/30/01	See Item (2) in Special Instructions.	See Item (3) in Special Instructions.	See Item (4) in Special Instructions.	PCBs - 8082	pH (Soil) - 9045	VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	Hydrazine - D1385	
Sample No.	**Matrix***	**Sample Date**	**Sample Time**								
...C81	SOIL	10/30/01	0830	X	X	X	X	X	X	X	

CHAIN OF POSSESSION	Date/Time	Sign/Print Names Received By/Stored In	Date/Time
Relinquished By/Removed From: Simpson/[illegible]	10-30-01 1215	REF-1A 3728BLDG.	10-30-01 1215
Relinquished By/Removed From: REF 1A 3728	11-1-01 0900	R Thorne	11-1-01 0900
Relinquished By/Removed From: R Thorne [illegible]	11-1-01 0900	FED EX	
Relinquished By/Removed From: Fed Ex	11/2/01 0935	V. Hernandez	11/2/01 0935
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

** The laboratory is to report Decane as a TIC if present in detectable quantities.
** The laboratory is to report both diesel and kerosene range compounds from WTPH-D analysis

~~(1) Gross Alpha; Gross Beta; Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Antimony-125, Barium-133, Cerium-134, Curium-242, Radium-226, Radium-228, Sodium-22, Tin-126}; Strontium-89,90 - Total Sr; Carbon-14; Total Uranium; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241; Neptunium-237; Isotopic Uranium~~ DSW 10.30.01
(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Aluminum, Beryllium, Bismuth, Boron, Calcium, Copper, Iron, Manganese, Molybdenum, Nickel, Potassium, Sodium, Thallium, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(3) NO2/NO3 - 353.2; IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010
(4) Semi-VOA - 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D

Matrix *: S=Soil, SE=Sediment, SO=Solid, SL=Sludge, W=Water, O=Oil, A=Air, DS=Drum Solids, DL=Drum Liquids, T=Tissue, WI=Wipe, L=Liquid, V=Vegetation, X=Other

...BORATORY SECTION	Received By	Title	Date/Time
...AL SAMPLE ...SPOSITION	Disposal Method	Disposed By	Date/Time

000017

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	(C)	D	E
PROJECT: 200-CS-1			DATA PACKAGE: ~~H1654~~ H1568		
VALIDATOR: TCI		LAB: LLI		DATE: 1 Dec 01	
CASE:			SDG: H1568		

ANALYSES PERFORMED					
☐ CLP Volatiles	☐ SW-846 8240 (cap column)	☐ SW-846 8260 (packed column)	☐ CLP Semivolatiles	☒ SW-846 8270 (cap column)	☐ SW-846 (packed column)
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX B13C81 Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . Yes No (N/A)

Is a case narrative present? . . . . . (Yes) No N/A

Comments: _____

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments: _____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

Is the GC/MS tuning/performance check acceptable? . . . . . Yes No N/A
Are initial calibrations acceptable? . . . . . Yes No N/A
Are continuing calibrations acceptable? . . . . . Yes No N/A
Comments:

4. BLANKS

Were laboratory blanks analyzed? . . . . . Yes No N/A
Are laboratory blank results acceptable? . . . . . Yes No N/A
Were field/trip blanks analyzed? . . . . . Yes No N/A
Are field/trip blank results acceptable? . . . . . Yes No N/A
Comments:

5. ACCURACY

Were surrogates/System Monitoring Compounds analyzed? . . . . . Yes No N/A
Are surrogate/System Monitoring Compound recoveries acceptable? Yes No N/A
Were MS/MSD samples analyzed? . . . . . Yes No N/A
Are MS/MSD results acceptable? . . . . . Yes No N/A
Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

6. PRECISION

Are MS/MSD RPD values acceptable? . . . . . Yes No N/A
Are field duplicate RPD values acceptable? . . . . . Yes No N/A
Are field split RPD values acceptable? . . . . . Yes No N/A
Comments:

7. SYSTEM PERFORMANCE

Were internal standards analyzed? . . . . . Yes No N/A
Are internal standard areas acceptable? . . . . . Yes No N/A
Are internal standard retention times acceptable? . . . . . Yes No N/A
Comments:

8. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . Yes No N/A
Is compound quantitation acceptable? . . . . . Yes No N/A
Comments:

9. REPORTED RESULTS AND QUANTITATION LIMITS

Are results reported for all requested analyses? . . . . . Yes No N/A
Are all results supported in the raw data? . . . . . Yes No N/A
Do results meet the CRQLs? . . . . . Yes No N/A
Has the laboratory properly identified and coded all TIC? . . . Yes No N/A
Comments:

Date: 6 December 2001
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200 Area Source Characterization 200-CS-1 Operable Unit - Waste Management
Subject: Inorganics - Data Package No. H1568-LLI (SDG No. H1568)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H1568-LLI prepared by Lionville Laboratory, Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
B13C81	10/30/01	Soil	C	See note 1

1-IC anions by 6010B; mercury by 7470A.

Data validation was conducted in accordance with the BHI validation statement of work and the *Sampling and Analysis Instruction for the 216-A-29 Ditch for Project W-211,* BHI-01562, Rev. 0, October 2001. Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY OBJECTIVES

- **Holding Times**

  Analytical holding times for ICP metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements is six (6) months for ICP metals and 28 days for mercury.

  All holding times were acceptable.

- **Blanks**

Preparation (Method) Blanks

At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "U". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the target required quantitation limit (PQL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the IDL and less than or equal to the PQL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

All preparation blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis, therefore, no field blank data was available for review.

- **Accuracy**

Matrix Spike

Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike recoveries must fall within the range of 70-130%. Samples with a spike recovery of less than 30% and a sample result below the instrument detection limit (IDL) are rejected and flagged "UR". Samples with a spike recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a spike recovery of greater than 130-70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a spike recovery greater than 130% and a sample result less than the IDL, no qualification is required.

All matrix spike recovery results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Laboratory duplicate sample analyses are used to measure laboratory precision and sample homogeneity. Results must be within relative percent difference (RPD) limits of plus or minus 30% for soil samples. If RPD values are out of specification and the sample concentration is greater than five times the PQL, all associated sample results are qualified as estimated and flagged "J". If RPD values are plus or minus two times the PQL and the sample concentration is less than five times the PQL, all associated sample results are qualified as estimated and flagged "J/UJ". The performance criteria for laboratory duplicates are an RPD less than 30% for positive sample results greater than five times the PQL or plus or minus 2 times the PQL for positive sample results less than five times the PQL. Sample results outside the criteria are qualified as estimates and flagged "J/UJ".

Due to an RPD of 30.1%, the boron result was qualified as an estimate and flagged "J".

All other laboratory duplicate results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the *Sampling and Analysis Instruction for the 216-A-29 Ditch for Project W-211* target required quantitation limits (PQL) to ensure that laboratory detection levels meet the required criteria. All reported laboratory detection levels met the analyte specific PQL.

- **Completeness**

Data package No. H1568-LLI was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to an RPD of 30.1%, the boron result was qualified as an estimate and flagged "J". Data flagged 'J' is an estimate, but under the BHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

BHI-01562, Rev. 0, *Sampling and Analysis Instruction for the 216-A-29 Ditch for Project W-211*, October 2001.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with BHI validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H1568	REVIEWER: TLI	DATE: 12/6/01	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Boron	J	All	RPD

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

INORGANIC ANALYSIS, SOIL MATRIX, MG/KG

Project: BECHTEL-HANFORD																	
Laboratory: Lionville Laboratory Inc.																	
Case:	SDG: H1568																
Sample Number		B13C81															
Remarks																	
Sample Date		10/30/01															
Inorganics	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Silver	2	0.07	U														
Aluminum		10100															
Arsenic	10	12.1															
Boron		3.1	J														
Barium	20	118															
Beryllium	0.5	0.08															
Bismuth		0.39	U														
Calcium		24300															
Cadmium	0.5	0.27															
Chromium	1	11.8															
Copper	2.5	19.5															
Iron		26400															
Mercury	0.2	0.02	U														
Potassium		2260															
Manganese		454															
Molybdenum		0.53															
Sodium		550															
Nickel	4	12.5															
Lead	10	11.7															
Selenium	10	0.27	U														
Thallium		0.52															
Vanadium	5	52.9															
Zinc	2	54.1															

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/13/01

CLIENT: TWU-HANFORD B02-008 LVL LOT #: 0111L256

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B13C81	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Aluminum, Total	10100	MG/KG	1.7	1.0
		Arsenic, Total	12.1	MG/KG	0.39	1.0
		Boron, Total	3.1 J	MG/KG	0.22	1.0
		Barium, Total	118	MG/KG	0.01	1.0
		Beryllium, Total	0.68	MG/KG	0.01	1.0
		Bismuth, Total	0.39 u	MG/KG	0.39	1.0
		Calcium, Total	24300	MG/KG	1.1	1.0
		Cadmium, Total	0.27	MG/KG	0.04	1.0
		Chromium, Total	11.8	MG/KG	0.07	1.0
		Copper, Total	19.5	MG/KG	0.06	1.0
		Iron, Total	26400	MG/KG	2.1	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	2260	MG/KG	2.4	1.0
		Manganese, Total	454	MG/KG	0.01	1.0
		Molybdenum, Total	0.53	MG/KG	0.13	1.0
		Sodium, Total	550	MG/KG	0.44	1.0
		Nickel, Total	12.5	MG/KG	0.12	1.0
		Lead, Total	11.7	MG/KG	0.23	1.0
		Selenium, Total	0.27 u	MG/KG	0.27	1.0
		Thallium, Total	0.52	MG/KG	0.34	1.0
		Vanadium, Total	52.9	MG/KG	0.06	1.0
		Zinc, Total	54.1	MG/KG	0.04	1.0

12/3/01

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LVLI
LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B02-008
LVL#: 0111L256
SDG/SAF#: H1568/H1571/B02-008

W.O.#: 11343-606-001-9999-00
Date Received: 11-02-01

METALS CASE NARRATIVE

1. This narrative covers the analyses of 2 soil samples.

2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary.

3. All analyses were performed within the required holding times.

4. All cooler temperatures have been recorded on the Chain of Custody.

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits with the exception of the final CCV for Nickel. All samples were surrounded by QC in control.

6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).

7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), MB value less than 5% of the RCRA limit, or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

8. All ICP Interference Check Standards were within control limits.

9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.

10. The matrix spike (MS) recoveries for 4 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A serial dilution is performed for Mercury. A PDS was prepared at meaningful concentration level for the following analytes:

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
B13C81	Aluminum	20,000	100.3
	Calcium	30,000	123.3
	Iron	30,000	107.7
	Manganese	1000	115.2

12. The duplicate analyses for 2 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

13. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

14. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated

11-15-01
Date

gmb/m11-256

Bechtel Hanford Inc. | **CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**

...ctor: ...omas, G/Watson, D	Company Contact: Carlock, CS	Telephone No.: 372-9638	Project Coordinator: TRENT, SJ	Price Code: ~~8N~~ 8K (initialed 11-1-01) — Data Turnaround: ~~45 Days~~ 15 Day (initialed 11-1-01)
...ct Designation: ...0 Area Source Characterization 200-CS-1 OU - Waste Mana...	Sampling Location: 200 East & West		SAF No.: B02-008	Air Quality ☐
...hest No.: See OSPC	Field Logbook No.: EL-1551	COA: XL2002CHOR	Method of Shipment: Fed Ex	
...ped To: ...RCRA	Offsite Property No.: A10XX18 ~~N/A~~ (initialed 10/30/01)		Bill of Lading/Air Bill No.: SEE OSPC ~~N/A~~ (initialed 10/30/01)	

...SIBLE SAMPLE HAZARDS/REMARKS

TIE TO B13C84

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 10/30/01. Collector not available to relinquish samples on 11/1/01 for shipment. RT 11-1-01

015

SAMPLE ANALYSIS								
Preservation	None	None	Cool 4C Cool 4C	Cool 4C Cool 4C	Cool 4C Cool 4C	None	Cool 4C Cool 4C	None
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG
No. of Container(s)	1	1	1	1	1	1	1	1
Volume	1000mL	500mL	1000mL	1000mL	120mL	60mL	120mL	120mL
Analysis	~~See Item (1) in Special Instructions.~~ DSW 10/30/01	See Item (2) in Special Instructions.	See Item (3) in Special Instructions.	See Item (4) in Special Instructions.	PCBs - 8082	pH (Soil) - 9045	VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	Hydrazine - D1385

Sample No.	Matrix *	Sample Date	Sample Time	Item (1)	Item (2)	Item (3)	Item (4)	PCBs	pH	VOA	Hydrazine
13C81	SOIL	10/30/01	0830		X	X	X	X	X	X	X

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DSimpson/[signature]	10-30-01 1215	REF-1A 3728 BLDG.	10-30-01 1215
Bldg 1A 3728	11-1-01 0900	RJ Thore	11-1-01 0900
RJ [signature] ERC	11-1-01 0900	FEDEX	
Fed Ex	11/2/01 0935	V. [signature]	11/2/01 0935

SPECIAL INSTRUCTIONS

** The laboratory is to report Decane as a TIC if present in detectable quantities.
** The laboratory is to report both diesel and kerosene range compounds from WTPH-D analysis

~~(1) Gross Alpha; Gross Beta; Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Antimony-125, Barium-133, Cesium-134, Curium-242, Radium-226, Radium-228, Radium-22, Tin-126}; Strontium-89,90 - Total Sr; Carbon-14; Total Uranium; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241; Neptunium-237; Isotopic Uranium~~ DSW 10-30-01

(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Aluminum, Beryllium, Bismuth, Boron, Calcium, Copper, Iron, Manganese, Molybdenum, Nickel, Potassium, Sodium, Thallium, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196

(3) NO2/NO3 - 353.2; IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010

(4) Semi-VOA -- 8270A (Add-On) (Tributyl phosphate); TPH-Diesel Range - WTPH-D

Matrix *: S=Soil, SE=Sediment, SO=Solid, SL=Sludge, W=Water, O=Oil, A=Air, DS=Drum Solids, DL=Drum Liquids, T=Tissue, WI=Wipe, L=Liquid, V=Vegetation, X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B02-008 H1568/H1571

DATE RECEIVED: 11/02/01 LVL LOT # :0111L256

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B13C81						
SILVER, TOTAL	001	S	01L0730	10/30/01	11/08/01	11/08/01
SILVER, TOTAL	001 REP	S	01L0730	10/30/01	11/08/01	11/08/01
SILVER, TOTAL	001 MS	S	01L0730	10/30/01	11/08/01	11/08/01
ALUMINUM, TOTAL	001	S	01L0730	10/30/01	11/08/01	11/08/01
ALUMINUM, TOTAL	001 REP	S	01L0730	10/30/01	11/08/01	11/08/01
ALUMINUM, TOTAL	001 MS	S	01L0730	10/30/01	11/08/01	11/08/01
ARSENIC, TOTAL	001	S	01L0730	10/30/01	11/08/01	11/08/01
ARSENIC, TOTAL	001 REP	S	01L0730	10/30/01	11/08/01	11/08/01
ARSENIC, TOTAL	001 MS	S	01L0730	10/30/01	11/08/01	11/08/01
BORON, TOTAL	001	S	01L0730	10/30/01	11/08/01	11/08/01
BORON, TOTAL	001 REP	S	01L0730	10/30/01	11/08/01	11/08/01
BORON, TOTAL	001 MS	S	01L0730	10/30/01	11/08/01	11/08/01
BARIUM, TOTAL	001	S	01L0730	10/30/01	11/08/01	11/08/01
BARIUM, TOTAL	001 REP	S	01L0730	10/30/01	11/08/01	11/08/01
BARIUM, TOTAL	001 MS	S	01L0730	10/30/01	11/08/01	11/08/01
BERYLLIUM, TOTAL	001	S	01L0730	10/30/01	11/08/01	11/08/01
BERYLLIUM, TOTAL	001 REP	S	01L0730	10/30/01	11/08/01	11/08/01
BERYLLIUM, TOTAL	001 MS	S	01L0730	10/30/01	11/08/01	11/08/01
BISMUTH, TOTAL	001	S	01L0730	10/30/01	11/08/01	11/08/01
BISMUTH, TOTAL REP	001 REP	S	01L0730	10/30/01	11/08/01	11/08/01
BISMUTH, TOTAL SPIKE	001 MS	S	01L0730	10/30/01	11/08/01	11/08/01
CALCIUM, TOTAL	001	S	01L0730	10/30/01	11/08/01	11/08/01
CALCIUM, TOTAL	001 REP	S	01L0730	10/30/01	11/08/01	11/08/01
CALCIUM, TOTAL	001 MS	S	01L0730	10/30/01	11/08/01	11/08/01
CADMIUM, TOTAL	001	S	01L0730	10/30/01	11/08/01	11/08/01
CADMIUM, TOTAL	001 REP	S	01L0730	10/30/01	11/08/01	11/08/01
CADMIUM, TOTAL	001 MS	S	01L0730	10/30/01	11/08/01	11/08/01
CHROMIUM, TOTAL	001	S	01L0730	10/30/01	11/08/01	11/08/01
CHROMIUM, TOTAL	001 REP	S	01L0730	10/30/01	11/08/01	11/08/01
CHROMIUM, TOTAL	001 MS	S	01L0730	10/30/01	11/08/01	11/08/01
COPPER, TOTAL	001	S	01L0730	10/30/01	11/08/01	11/08/01
COPPER, TOTAL	001 REP	S	01L0730	10/30/01	11/08/01	11/08/01
COPPER, TOTAL	001 MS	S	01L0730	10/30/01	11/08/01	11/08/01
IRON, TOTAL	001	S	01L0730	10/30/01	11/08/01	11/08/01
IRON, TOTAL	001 REP	S	01L0730	10/30/01	11/08/01	11/08/01

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B02-008

DATE RECEIVED: 11/02/01 LVL LOT # :0111L256

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
IRON, TOTAL	001 MS	S	01L0730	10/30/01	11/08/01	11/08/01
MERCURY, TOTAL	001	S	01C0352	10/30/01	11/08/01	11/08/01
MERCURY, TOTAL	001 REP	S	01C0352	10/30/01	11/08/01	11/08/01
MERCURY, TOTAL	001 MS	S	01C0352	10/30/01	11/08/01	11/08/01
POTASSIUM, TOTAL	001	S	01L0730	10/30/01	11/08/01	11/08/01
POTASSIUM, TOTAL	001 REP	S	01L0730	10/30/01	11/08/01	11/08/01
POTASSIUM, TOTAL	001 MS	S	01L0730	10/30/01	11/08/01	11/08/01
MANGANESE, TOTAL	001	S	01L0730	10/30/01	11/08/01	11/08/01
MANGANESE, TOTAL	001 REP	S	01L0730	10/30/01	11/08/01	11/08/01
MANGANESE, TOTAL	001 MS	S	01L0730	10/30/01	11/08/01	11/08/01
MOLYBDENUM, TOTAL	001	S	01L0730	10/30/01	11/08/01	11/08/01
MOLYBDENUM, TOTAL	001 REP	S	01L0730	10/30/01	11/08/01	11/08/01
MOLYBDENUM, TOTAL	001 MS	S	01L0730	10/30/01	11/08/01	11/08/01
SODIUM, TOTAL	001	S	01L0730	10/30/01	11/08/01	11/08/01
SODIUM, TOTAL	001 REP	S	01L0730	10/30/01	11/08/01	11/08/01
SODIUM, TOTAL	001 MS	S	01L0730	10/30/01	11/08/01	11/08/01
NICKEL, TOTAL	001	S	01L0730	10/30/01	11/08/01	11/08/01
NICKEL, TOTAL	001 REP	S	01L0730	10/30/01	11/08/01	11/08/01
NICKEL, TOTAL	001 MS	S	01L0730	10/30/01	11/08/01	11/08/01
LEAD, TOTAL	001	S	01L0730	10/30/01	11/08/01	11/08/01
LEAD, TOTAL	001 REP	S	01L0730	10/30/01	11/08/01	11/08/01
LEAD, TOTAL	001 MS	S	01L0730	10/30/01	11/08/01	11/08/01
SELENIUM, TOTAL	001	S	01L0730	10/30/01	11/08/01	11/08/01
SELENIUM, TOTAL	001 REP	S	01L0730	10/30/01	11/08/01	11/08/01
SELENIUM, TOTAL	001 MS	S	01L0730	10/30/01	11/08/01	11/08/01
THALLIUM, TOTAL	001	S	01L0730	10/30/01	11/08/01	11/08/01
THALLIUM, TOTAL	001 REP	S	01L0730	10/30/01	11/08/01	11/08/01
THALLIUM, TOTAL	001 MS	S	01L0730	10/30/01	11/08/01	11/08/01
VANADIUM, TOTAL	001	S	01L0730	10/30/01	11/08/01	11/08/01
VANADIUM, TOTAL	001 REP	S	01L0730	10/30/01	11/08/01	11/08/01
VANADIUM, TOTAL	001 MS	S	01L0730	10/30/01	11/08/01	11/08/01
ZINC, TOTAL	001	S	01L0730	10/30/01	11/08/01	11/08/01
ZINC, TOTAL	001 REP	S	01L0730	10/30/01	11/08/01	11/08/01
ZINC, TOTAL	001 MS	S	01L0730	10/30/01	11/08/01	11/08/01
B13CK9						
SILVER, TOTAL	002	S	01L0730	10/31/01	11/08/01	11/08/01

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	(C)	D	E
PROJECT: 200-CS-1			DATA PACKAGE: #1568		
VALIDATOR: TLI		LAB: LCE		DATE: 1Dec07	
CASE:			SDG: #1568		

ANALYSES PERFORMED					
☒ CLP/ICP	☐ CLP/GFAA	☐ CLP/Hg	☐ CLP/Cyanide	☐	☐
☐ SW-846/ICP	☐ SW-846/GFAA	☒ SW-846/Hg	☐ SW-846 Cyanide	☐	☐

SAMPLES/MATRIX B13C81 soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . Yes No (N/A)

Is a case narrative present? . . . . . (Yes) No N/A

Comments: _____

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

Were initial calibrations performed on all instruments? . . . . Yes No N/A
Are initial calibrations acceptable? . . . . . Yes No N/A
Are ICP interference checks acceptable? . . . . . Yes No N/A
Were ICV and CCV checks performed on all instruments? . . . . . Yes No N/A
Are ICV and CCV checks acceptable? . . . . . Yes No N/A

Comments:_____

4. BLANKS

Were ICB and CCB checks performed for all applicable analyses? Yes No N/A
Are ICB and CCB results acceptable? . . . . . Yes No N/A
Were preparation blanks analyzed? . . . . . Yes No N/A
Are preparation blank results acceptable? . . . . . Yes No N/A
Were field/trip blanks analyzed? . . . . . Yes No N/A
Are field/trip blank results acceptable? . . . . . Yes No N/A

Comments:_____

5. ACCURACY

Were spike samples analyzed? . . . . . Yes No N/A
Are spike sample recoveries acceptable? . . . . . Yes No N/A
Were laboratory control samples (LCS) analyzed? . . . . . Yes No N/A
Are LCS recoveries acceptable? . . . . . Yes No N/A

Comments: al, calcium, iron manganese sodium, potassium
J OK

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

6. PRECISION

Were laboratory duplicates analyzed?	(Yes)	No	N/A
Are laboratory duplicate samples RPD values acceptable?	Yes	(No)	N/A
Were ICP serial dilution samples analyzed?	Yes	No	(N/A)
Are ICP serial dilution %D values acceptable?	Yes	No	(N/A)
Are field duplicate RPD values acceptable?	Yes	No	(N/A)
Are field split RPD values acceptable?	Yes	No	(N/A)

Comments: Boron 30.1 J

7. FURNACE AA QUALITY CONTROL

Were duplicate injections performed as required?	Yes	No	N/A
Are duplicate injection %RSD values acceptable?	Yes	No	N/A
Were analytical spikes performed as required?	Yes	No	N/A
Are analytical spike recoveries acceptable?	Yes	No	N/A
Was MSA performed as required?	Yes	No	N/A
Are MSA results acceptable?	Yes	No	N/A

Comments:

8. REPORTED RESULTS AND DETECTION LIMITS

Are results reported for all requested analyses?	(Yes)	No	N/A
Are all results supported in the raw data?	Yes	No	(N/A)
Are results calculated properly?	Yes	No	(N/A)
Do results meet the CRDLs?	(Yes)	No	N/A

Comments:

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/13/01

CLIENT: TNU-HANFORD E02-008 LVL LOT #: 0111L256

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	01L0730-MB1	Silver, Total	0.06 u	MG/KG	0.06	1.0
		Aluminum, Total	4.2	MG/KG	1.4	1.0
		Arsenic, Total	0.32 u	MG/KG	0.32	1.0
		Boron, Total	0.52	MG/KG	0.18	1.0
		Barium, Total	0.07	MG/KG	0.01	1.0
		Beryllium, Total	0.01	MG/KG	0.01	1.0
		Bismuth, Total	0.32 u	MG/KG	0.32	1.0
		Calcium, Total	2.7	MG/KG	0.89	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Chromium, Total	0.11	MG/KG	0.06	1.0
		Copper, Total	0.12	MG/KG	0.05	1.0
		Iron, Total	1.7 u	MG/KG	1.7	1.0
		Potassium, Total	8.3	MG/KG	1.9	1.0
		Manganese, Total	0.02	MG/KG	0.01	1.0
		Molybdenum, Total	0.11 u	MG/KG	0.11	1.0
		Sodium, Total	7.5	MG/KG	0.36	1.0
		Nickel, Total	0.10 u	MG/KG	0.10	1.0
		Lead, Total	0.19 u	MG/KG	0.19	1.0
		Selenium, Total	0.22 u	MG/KG	0.22	1.0
		Thallium, Total	0.28 u	MG/KG	0.28	1.0
		Vanadium, Total	0.05 u	MG/KG	0.05	1.0
		Zinc, Total	0.15	MG/KG	0.03	1.0
BLANK1	01C0352-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 11/13/01

CLIENT: TNU-HANFORD B02-008 LVL LOT #: 0111L256

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B13C81	Silver, Total	5.4	0.07u	6.1	88.5	1.0
		Aluminum, Total	11000	10100	243	376.4*	1.0
		Arsenic, Total	227	12.1	243	88.4	1.0
		Boron, Total	107	3.1	122	85.2	1.0
		Barium, Total	330	118	243	87.5	1.0
		Beryllium, Total	5.4	0.06	6.1	87.2	1.0
		Bismuth, Total	557	0.39u	608	91.7	1.0
		Calcium, Total	28800	24300	3040	148.7*	1.0
		Cadmium, Total	5.5	0.27	6.1	85.8	1.0
		Chromium, Total	33.0	11.8	24.3	87.2	1.0
		Copper, Total	48.9	19.5	30.4	96.7	1.0
		Iron, Total	25500	26400	122	-790. *	1.0
		Mercury, Total	0.20	0.02u	0.20	101.0	1.0
		Potassium, Total	5470	2260	3040	105.4	1.0
		Manganese, Total	489	454	60.8	57.4*	1.0
		Molybdenum, Total	106	0.53	122	86.5	1.0
		Sodium, Total	3600	550	3040	100.5	1.0
		Nickel, Total	65.3	12.5	60.8	86.8	1.0
		Lead, Total	63.9	11.7	60.8	85.9	1.0
		Selenium, Total	207	0.27u	243	85.0	1.0
		Thallium, Total	206	0.52	243	84.4	1.0
		Vanadium, Total	104	52.9	60.8	84.4	1.0
		Zinc, Total	106	84.1	60.8	85.0	1.0

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Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 11/13/01

CLIENT: TWU-HANFORD B02-008 LVL LOT #: 0111L256

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B13C81	Silver, Total	0.07u	0.07u	NC	1.0
		Aluminum, Total	10100	10600	4.2	1.0
		Arsenic, Total	12.1	12.5	3.3	1.0
		Boron, Total	3.1	4.2	30.1	1.0
		Barium, Total	118	122	3.2	1.0
		Beryllium, Total	0.08	0.10	27.1	1.0
		Bismuth, Total	0.39u	0.39u	NC	1.0
		Calcium, Total	24300	24800	2.2	1.0
		Cadmium, Total	0.27	0.26	4.2	1.0
		Chromium, Total	11.8	12.0	1.7	1.0
		Copper, Total	19.5	19.4	0.51	1.0
		Iron, Total	26400	26700	0.83	1.0
		Mercury, Total	0.02u	0.02u	NC	1.0
		Potassium, Total	2260	2350	3.6	1.0
		Manganese, Total	454	460	1.5	1.0
		Molybdenum, Total	0.53	0.49	7.2	1.0
		Sodium, Total	550	598	8.4	1.0
		Nickel, Total	12.5	12.5	0.00	1.0
		Lead, Total	11.7	11.7	0.00	1.0
		Selenium, Total	0.27u	0.27u	NC	1.0
		Thallium, Total	0.52	0.57	9.3	1.0
		Vanadium, Total	52.9	53.1	0.38	1.0
		Zinc, Total	54.1	54.4	0.55	1.0

Date: 6 December 2001
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200 Area Source Characterization 200-CS-1 Operable Unit - Waste Management
Subject: Wet Chemistry - Data Package No. H1568-LLI (SDG No. H1568)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H1568-LLI prepared by Lionville Laboratory, Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
B13C81	10/30/01	Soil	C	See note 1 & 2

1-IC Anions - 300.0 (chloride, fluoride, nitrate, nitrite, phosphate, sulfate); chromium VI by 7196A; ammonia - 350.3; hydrazine USAFSAM-Report TR-82-29; nitrate/nitrite 353.2; sulphide 9030B.
2-Nitrate not validated per BHI instructions (SAF B02-008).

Data validation was conducted in accordance with the BHI validation statement of work and the *Sampling and Analysis Instruction for the 216-A-29 Ditch for Project W-211,* BHI-01562, Rev. 0, October 2001. Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY OBJECTIVES

- **Holding Times**

  Analytical holding times are assessed to ascertain whether the holding time requirements have been met by the laboratory. The holding time requirements are as follows: 30 days for chromium VI; 28 days for ammonia, hydrazine, nitrate/nitrite and ICP anions (chloride, sulphate, fluoride); 14 days for cyanide;

7 days for sulphide; 2 days for ICP anions (nitrate, nitrite, phosphate); and immediate for pH.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

Holding times were met for all parameters and samples.

- **Method Blanks**

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. All blank results must fall below the project quantitation limit (PQL) to be acceptable.

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis, therefore, no field blank data was available for review.

- **Accuracy**

Matrix Spike

Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike recoveries must fall within the range of 70-130%. Samples with a spike recovery of less than 30% and a sample value below the instrument detection limit (IDL) are rejected and flagged "UR". Samples with a spike recovery of 30-69% and a sample result less than the IDL are qualified "UJ". Samples with a spike recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified "J". Finally, for samples with a spike recovery greater than 130% and a sample result less than the IDL, no qualification is required.

All matrix spike recovery results were acceptable.

- **Precision**

  Laboratory Duplicate Samples

  Laboratory duplicate sample analyses are used to measure laboratory precision and sample homogeneity. Results must be within relative percent difference (RPD) limits of plus or minus 30%. If RPD values are out of specification and the sample concentration is greater than five times the PQL, all associated sample results are qualified as estimated and flagged "J". If RPD values are plus or minus two times the PQL and the sample concentration is less than five times the PQL, all associated sample results are qualified as estimated and flagged "J/UJ". The performance criteria for aqueous laboratory duplicates are an RPD less than 30% for positive sample results greater than five times the PQL or plus or minus the PQL for positive sample results less than five times the PQL. Sample results outside the criteria are qualified as estimates and flagged "J/UJ".

  Due to an RPD outside QC limits (32.3%), the chloride result was qualified as an estimate and flagged "J".

  Due to an RPD outside QC limits (34.5%), the ammonia result was qualified as an estimate and flagged "J".

  All other laboratory duplicate results were within the required control limits.

  Field Duplicate Samples

  No field duplicate results were submitted for analysis.

- **Analytical Detection Levels**

  Reported analytical detection levels are compared against Sampling and Analysis Instruction for the 216-A-29 Ditch for Project W-211 target required quantitation limits (PQL) to ensure that laboratory detection levels meet the required criteria. Nitrite, cyanide and sulphide results were reported above the PQL. Under the BHI statement of work, no qualification is required. All other reported laboratory detection levels met the analyte specific PQL.

- **Completeness**

Data package No. H1568-LLI was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to an RPD outside QC limits (32.3%), the chloride result was qualified as an estimate and flagged "J". Due to an RPD outside QC limits (34.5%), the ammonia result was qualified as an estimate and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

Nitrite, cyanide and sulphide results were reported above the PQL. Under the BHI statement of work, no qualification is required.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

BHI-01562, Rev. 0, *Sampling and Analysis Instruction for the 216-A-29 Ditch for Project W-211,* October 2001

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with WHC procedures are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. The associated concentration is an estimate, but the data are usable for decision-making purposes.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H1568	REVIEWER: TLI	DATE: 12/6/01	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Chloride Ammonia	J	All	RPD

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

GENERAL CHEMISTRY ANALYSIS, SOIL MATRIX, (MG/KG) Page__1__of__1__

Project: BECHTEL-HANFORD																									
Laboratory: Lionville Laboratory Inc.																									
Case:	SDG: H1568																								
Sample Number		B13C81																							
Remarks																									
Sample Date		10/30/01																							
General Chemistry	TRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloride	2	6.6	J																						
Fluoride	5	3.0	U																						
Nitrite	0.75	1.52	U																						
Nitrate	0.75	300																							
Cyanide, total	0.5	0.53	U																						
Phosphate	5	1.5	U																						
Chromium VI	0.5	0.49	U																						
Sulfate	5	61.7																							
Hydrazine		1.2	U																						
Nitrate/nitrite	0.75	69.6																							
Ammonia		11.6	J																						
pH		8.3																							
Sulphide	5	46.4	U																						

0000010

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results. All other qualifiers shown were applied during validation.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/16/01

CLIENT: TWU-HANFORD B02-008 H1568/H1571 LVL LOT #: 0111L256

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B13C81	% Solids	82.3	%	0.01	1.0
		Chloride by IC	6.6 J	MG/KG	1.5	1.0
		Fluoride by IC	3.0 u	MG/KG	3.0	1.0
		Nitrite by IC	1.52 u	MG/KG	1.52	1.0
		Nitrate by IC	300	MG/KG	15.2	10.0
		Cyanide, Total	0.53 u	MG/KG	0.53	1.0
		Phosphate by IC	1.5 u	MG/KG	1.5	1.0
		Chromium VI	0.49 u	MG/KG	0.49	1.0
		Sulfate by IC	61.7	MG/KG	1.5	1.0
		Hydrazine	1.2 u	MG/KG	1.2	1.0
		Nitrate Nitrite	69.6	MG/KG	2.4	10.0
		Ammonia, as N	11.6 J	MG/KG	3.7	1.0
		pH	8.3	SOIL PH	0.01	1.0
		Sulfide	46.4 u	MG/KG	46.4	1.0
-002	B13C89	% Solids	65.0	%	0.01	1.0
		Chloride by IC	226	MG/KG	9.6	5.0
		Fluoride by IC	19.2 u	MG/KG	19.2	5.0
		Nitrite by IC	9.62 u	MG/KG	9.62	5.0
		Nitrate by IC	771	MG/KG	38.5	20.0
		Cyanide, Total	0.72 u	MG/KG	0.72	1.0
		Phosphate by IC	9.6 u	MG/KG	9.6	5.0
		Chromium VI	3.0	MG/KG	0.62	1.0
		Sulfate by IC	2970	MG/KG	192	100
		Hydrazine	1.5 u	MG/KG	1.5	1.0
		Nitrate Nitrite	210	MG/KG	6.3	20.0
		Ammonia, as N	34.3	MG/KG	3.8	1.0
		pH	6.5	SOIL PH	0.01	1.0
		Sulfide	61.2 u	MG/KG	61.2	1.0

12/3/01

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LVLI
LIONVILLE LABORATORY INC

Analytical Report

Client: TNU-HANFORD B02-008 H1568/H1571
LVL#: 0111L256

W.O.#: 11343-606-001-9999-00
Date Received: 11-02-01

INORGANIC NARRATIVE

1. This narrative covers the analyses of 2 soil samples.

2. The samples were prepared and analyzed in accordance with the methods indicated on the attached glossary.

3. Sample holding times as required by the method and/or contract were met.

4. The cooler temperatures were recorded on the chain of custody.

5. The method blanks were within the method criteria.

6. The Laboratory Control Samples (LCS) were within the laboratory control limits. The duplicate LCS were within the 20% Relative Percent Difference (RPD) control limit.

7. The matrix spike recoveries were within the 75-125% control limits with the exception of Sulfide that was below the control limits that may be attributed to sample inhomogeneity.

8. The replicate analyses were within the 20% RPD control limit with the exception of Chloride, Ammonia and Sulfide that may be attributed to sample inhomogeneity.

9. Results for solid samples are reported on a dry weight basis.

10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

11-19-01
Date

Iain Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated

njp\111-256

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B02-008-01	Page 1 of 1
Collector: Thomas, G/Watson, D	Company Contact: Cearlock, CS — Telephone No.: 372-9638	Project Coordinator: TRENT, SJ	Price Code: 8N RT 11-1-01 8K — Data Turnaround: ~~45 Days~~ RT 15 Day — Air Quality ☐
Project Designation: 200 Area Source Characterization 200-CS-1 OU - Waste Mana	Sampling Location: 200 East & West	SAF No.: B02-008	
Ice Chest No.: See COPC	Field Logbook No.: EL-1551 — COA: XL2002CHGR	Method of Shipment: Fed Ex	
Shipped To: TWRS/RECRA	Offsite Property No.: A/A DSW 10/30/01	Bill of Lading/Air Bill No.: See COPC A/A DSW 10/30/01	

POSSIBLE SAMPLE HAZARDS/REMARKS

TIE TO B13C84

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 10/30/01. Collector not available to relinquish samples on 11/1/01 for shipment. RT 11-01

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Preservation	None	None	Cool 4C Cool 4C	Cool 4C Cool 4C	Cool 4C Cool 4C	None	Cool 4C Cool 4C	None		
				Type of Container	aG	aG	aG	aG	aG	aG	aG	aG		
				No. of Container(s)	1	1	1	1	1	1	1	1		
				Volume	1000mL	500mL	1000mL	1000mL	120mL	60mL	120mL	120mL		
					See item (1) in Special Instructions. DSW 10/30/01	See item (2) in Special Instructions.	See item (3) in Special Instructions.	See item (4) in Special Instructions.	PCBs - 8082	pH (Soil) - 9045	VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	Hydrazine - D1385		
B13C81	SOIL	10/30/01	0830		X	X	X	X	X	X	X			

CHAIN OF POSSESSION — Signs/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DSwatson/GWatson	10 30 01 1215	REF-1A 3728B16	10-30-01 1215
Ref 1A 3728	11-1-01 0900	R Thorp	11-1-01 0900
R Thorp ERC	11-1-01 0900	7-EDRS	
Fed Ex	11/2/01 0935	V. Hennessy	11/2/01 0935

SPECIAL INSTRUCTIONS

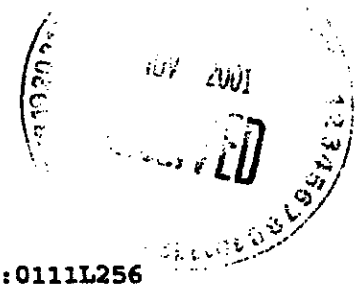
** The laboratory is to report Decane as a TIC if present in detectable quantities.
** The laboratory is to report both diesel and kerosene range compounds from WTPH-D analysis

(1) ~~Gross Alpha, Gross Beta, Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Antimony-125, Barium-133, Cesium-134, Curium-242, Radium-226, Radium-228, Sodium-22, Tin-126); Strontium-89,90 - Total Sr, Carbon-14; Total Uranium; Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241; Neptunium-237; Isotopic Uranium~~ DSW 10.30.01
(2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Aluminum, Beryllium, Bismuth, Boron, Calcium, Copper, Iron, Manganese, Molybdenum, Nickel, Potassium, Sodium, Thallium, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(3) NO2/NO3 - 353.2; IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010
(4) Semi-VOA - 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D

Matrix *
S=Soil
SD=Sediment
SO=Solid
SI=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (10/99)



Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B02-008 H1568/H1571

DATE RECEIVED: 11/02/01 LVL LOT # :0111L256

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B13C81						
% SOLIDS	001	S	01L%S152	10/30/01	11/05/01	11/06/01
% SOLIDS	001 REP	S	01L%S152	10/30/01	11/05/01	11/06/01
CHLORIDE BY IC	001	S	01LXC074	10/30/01	11/08/01	11/08/01
CHLORIDE BY IC	001 REP	S	01LXC074	10/30/01	11/08/01	11/08/01
CHLORIDE BY IC	001 MS	S	01LXC074	10/30/01	11/08/01	11/08/01
FLUORIDE BY IC	001	S	01LXC074	10/30/01	11/08/01	11/08/01
FLUORIDE BY IC	001 REP	S	01LXC074	10/30/01	11/08/01	11/08/01
FLUORIDE BY IC	001 MS	S	01LXC074	10/30/01	11/08/01	11/08/01
NITRITE BY IC	001	S	01LXC074	10/30/01	11/08/01	11/08/01
NITRITE BY IC	001 REP	S	01LXC074	10/30/01	11/08/01	11/08/01
NITRITE BY IC	001 MS	S	01LXC074	10/30/01	11/08/01	11/08/01
NITRATE BY IC	001	S	01LXC074	10/30/01	11/08/01	11/08/01
NITRATE BY IC	001 REP	S	01LXC074	10/30/01	11/08/01	11/08/01
NITRATE BY IC	001 MS	S	01LXC074	10/30/01	11/08/01	11/08/01
TOTAL CYANIDE	001	S	01LCA98	10/30/01	11/09/01	11/09/01
PHOSPHATE BY IC	001	S	01LXC074	10/30/01	11/08/01	11/08/01
PHOSPHATE BY IC	001 REP	S	01LXC074	10/30/01	11/08/01	11/08/01
PHOSPHATE BY IC	001 MS	S	01LXC074	10/30/01	11/08/01	11/08/01
CHROMIUM VI	001	S	01LVI086	10/30/01	11/07/01	11/07/01
CHROMIUM VI	001 REP	S	01LVI086	10/30/01	11/07/01	11/07/01
CHROMIUM VI	001 MS	S	01LVI086	10/30/01	11/07/01	11/07/01
CHROMIUM VI	001 MS	S	01LVI086	10/30/01	11/07/01	11/07/01
SULFATE BY IC	001	S	01LXC074	10/30/01	11/08/01	11/08/01
SULFATE BY IC	001 REP	S	01LXC074	10/30/01	11/08/01	11/08/01
SULFATE BY IC	001 MS	S	01LXC074	10/30/01	11/08/01	11/08/01
HYDRAZINE	001	S	01LHZ004	10/30/01	11/06/01	11/06/01
HYDRAZINE	001 REP	S	01LHZ004	10/30/01	11/06/01	11/06/01
HYDRAZINE	001 MS	S	01LHZ004	10/30/01	11/06/01	11/06/01
NITRATE NITRITE	001	S	01LN3061	10/30/01	11/15/01	11/15/01
NITRATE NITRITE	001 REP	S	01LN3061	10/30/01	11/15/01	11/15/01
NITRATE NITRITE	001 MS	S	01LN3061	10/30/01	11/15/01	11/15/01
AMMONIA	001	S	01LAM050	10/30/01	11/08/01	11/08/01
PH	001	S	01LPH075	10/30/01	11/05/01	11/05/01
PH	001 REP	S	01LPH075	10/30/01	11/05/01	11/05/01
SULFIDE	001	S	01LSDA60	10/30/01	11/05/01	11/05/01

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B02-008 H1568/H1571

DATE RECEIVED: 11/02/01 LVL LOT # :0111L256

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B13CK9						
% SOLIDS	002	S	01L%S152	10/31/01	11/05/01	11/06/01
CHLORIDE BY IC	002	S	01LXC074	10/31/01	11/08/01	11/08/01
FLUORIDE BY IC	002	S	01LXC074	10/31/01	11/08/01	11/08/01
NITRITE BY IC	002	S	01LXC074	10/31/01	11/08/01	11/08/01
NITRATE BY IC	002	S	01LXC074	10/31/01	11/08/01	11/08/01
TOTAL CYANIDE	002	S	01LCA98	10/31/01	11/09/01	11/09/01
TOTAL CYANIDE	002 REP	S	01LCA98	10/31/01	11/09/01	11/09/01
TOTAL CYANIDE	002 MS	S	01LCA98	10/31/01	11/09/01	11/09/01
PHOSPHATE BY IC	002	S	01LXC074	10/31/01	11/08/01	11/08/01
CHROMIUM VI	002	S	01LVI086	10/31/01	11/07/01	11/07/01
SULFATE BY IC	002	S	01LXC074	10/31/01	11/08/01	11/08/01
HYDRAZINE	002	S	01LHZ004	10/31/01	11/06/01	11/06/01
NITRATE NITRITE	002	S	01LN3061	10/31/01	11/15/01	11/15/01
AMMONIA	002	S	01LAM050	10/31/01	11/08/01	11/08/01
AMMONIA	002 REP	S	01LAM050	10/31/01	11/08/01	11/08/01
AMMONIA	002 MS	S	01LAM050	10/31/01	11/08/01	11/08/01
PH	002	S	01LPH075	10/31/01	11/05/01	11/05/01
SULFIDE	002	S	01LSDA60	10/31/01	11/05/01	11/05/01
SULFIDE	002 REP	S	01LSDA60	10/31/01	11/05/01	11/05/01
SULFIDE	002 MS	S	01LSDA60	10/31/01	11/05/01	11/05/01
LAB QC:						
CHLORIDE BY IC	MB1	S	01LXC074	N/A	11/08/01	11/08/01
CHLORIDE BY IC	MB1 BS	S	01LXC074	N/A	11/08/01	11/08/01
FLUORIDE BY IC	MB1	S	01LXC074	N/A	11/08/01	11/08/01
FLUORIDE BY IC	MB1 BS	S	01LXC074	N/A	11/08/01	11/08/01
NITRITE BY IC	MB1	S	01LXC074	N/A	11/08/01	11/08/01
NITRITE BY IC	MB1 BS	S	01LXC074	N/A	11/08/01	11/08/01
NITRATE BY IC	MB1	S	01LXC074	N/A	11/08/01	11/08/01
NITRATE BY IC	MB1 BS	S	01LXC074	N/A	11/08/01	11/08/01
TOTAL CYANIDE	LCS L	S	01LCA98	N/A	11/09/01	11/09/01
TOTAL CYANIDE	LCS L	S	01LCA98	N/A	11/09/01	11/09/01
TOTAL CYANIDE	MB1	S	01LCA98	N/A	11/09/01	11/09/01
PHOSPHATE BY IC	MB1	S	01LXC074	N/A	11/08/01	11/08/01

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B02-008 H1568/H1571

DATE RECEIVED: 11/02/01 LVL LOT # :0111L256

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
PHOSPHATE BY IC	MB1 BS	S	01LXC074	N/A	11/08/01	11/08/01
CHROMIUM VI	MB1	S	01LVI086	N/A	11/07/01	11/07/01
CHROMIUM VI	MB1 BS	S	01LVI086	N/A	11/07/01	11/07/01
CHROMIUM VI	MB1 BS	S	01LVI086	N/A	11/07/01	11/07/01
SULFATE BY IC	MB1	S	01LXC074	N/A	11/08/01	11/08/01
SULFATE BY IC	MB1 BS	S	01LXC074	N/A	11/08/01	11/08/01
HYDRAZINE	MB1	S	01LHZ004	N/A	11/06/01	11/06/01
HYDRAZINE	MB1 BS	S	01LHZ004	N/A	11/06/01	11/06/01
HYDRAZINE	MB1 BSD	S	01LHZ004	N/A	11/06/01	11/06/01
NITRATE NITRITE	MB1	S	01LN3061	N/A	11/15/01	11/15/01
NITRATE NITRITE	MB1 BS	S	01LN3061	N/A	11/15/01	11/15/01
AMMONIA	MB1	S	01LAM050	N/A	11/08/01	11/08/01
AMMONIA	MB1 BS	S	01LAM050	N/A	11/08/01	11/08/01
AMMONIA	MB1 BSD	S	01LAM050	N/A	11/08/01	11/08/01
SULFIDE	MB1	S	01LSDA60	N/A	11/05/01	11/05/01
SULFIDE	MB1 BS	S	01LSDA60	N/A	11/05/01	11/05/01

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	(C)	D	E
PROJECT: 200-CS-1			DATA PACKAGE: H1568		
VALIDATOR: TLI		LAB: LLI		DATE: 12/1/01	
CASE:			SDG: H1568		

ANALYSES PERFORMED

☒ Anions/IC	☐ TOC	☐ TOX	☐ TPH-418.1	Oil and Grease	Alkalinity
☒ Ammonia	☐ BOD/COD	☐ Chloride	☒ Chromium-VI	☒ pH	☒ NO_3/NO_2
☐ Sulfate	☐ TDS	☐ TKN	☐ Phosphate	☒ Hydrazine	☐
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX B13C81 Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . Yes No (N/A)

Is a case narrative present? . . . . . (Yes) No N/A

Comments: _____

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments: _____

A-25

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION

Was initial calibration performed for all applicable analyses?	Yes	No	N/A
Are initial calibration results acceptable?	Yes	No	N/A
Was a calibration check performed for all applicable analyses?	Yes	No	N/A
Are calibration check results acceptable?	Yes	No	N/A

Comments:_____

4. BLANKS

Were laboratory blanks analyzed?	Yes	No	N/A
Are laboratory blank results acceptable?	Yes	No	N/A
Were field/trip blanks analyzed?	Yes	No	N/A
Are field/trip blank results acceptable?	Yes	No	N/A

Comments:_____

5. ACCURACY

Were spike samples analyzed at the required frequency?	Yes	No	N/A
Are spike recoveries acceptable?	Yes	No	N/A
Were LCS analyses performed at the required frequency?	Yes	No	N/A
Are LCS recoveries acceptable?	Yes	No	N/A

Comments:_____

6. PRECISION

Were laboratory duplicate samples analyzed at the required frequency?	Yes	No	N/A
Are laboratory duplicate sample RPD values acceptable?	Yes	No	N/A
Are field duplicate RPD values acceptable?	Yes	No	N/A
Are field split RPD values acceptable?	Yes	No	N/A

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

Comments: Chloride (32.3%) } J all
Ammonia (39.5%)

Sulphide RPD incorrect but are U

7. ANALYTE QUANTITATION

Was analyte quantitation performed properly? . . . . . Yes No (N/A)

Comments:

8. REPORTED RESULTS AND DETECTION LIMITS

Are results reported for all requested analyses? . . . . . (Yes) No N/A

Are results supported in the raw data? . . . . . Yes No (N/A)

Are results calculated properly? . . . . . Yes No (N/A)

Do results meet the CRDLs? . . . . . Yes (No) N/A

Comments: Nitrate + sulphide - over PQL
+ cyanide

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/16/01

CLIENT: TNU-HANFORD E02-008 H1568/H1571 LVL LOT #: 0111L256
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	01LXC074-MB1	Chloride by IC	1.2	u	MG/KG	1.2	1.0
		Fluoride by IC	2.5	u	MG/KG	2.5	1.0
		Nitrite by IC	1.25	u	MG/KG	1.25	1.0
		Nitrate by IC	1.25	u	MG/KG	1.25	1.0
		Phosphate by IC	1.2	u	MG/KG	1.2	1.0
		Sulfate by IC	1.2	u	MG/KG	1.2	1.0
BLANK1	01LCA98-MB1	Cyanide, Total	0.50	u	MG/KG	0.50	1.0
BLANK10	01LVI086-MB1	Chromium VI	0.40	u	MG/KG	0.40	1.0
BLANK10	01LHZ004-MB1	Hydrazine	1.0	u	MG/KG	1.0	1.0
BLANK10	01LN3061-MB1	Nitrate Nitrite	0.20	u	MG/KG	0.20	1.0
BLANK10	01LAM050-MB1	Ammonia, as N	2.5	u	MG/KG	2.5	1.0
BLANK10	01LSDA60-MB1	Sulfide	40.0	u	MG/KG	40.0	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 11/16/01

CLIENT: TNU-HANFORD B02-008 H1568/H1571 LVL LOT #: 0111L256

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B13C81	Chloride by IC	37.1	6.6	30.0	101.6	1.0
		Fluoride by IC	65.1	0.74	61.0	105.5	1.0
		Nitrite by IC	30.2	1.52u	30.0	100.8	1.0
		Nitrate by IC	902	300	608	99.0	20.0
		Phosphate by IC	30.3	1.5 u	30.0	101.0	1.0
		Soluble Chromium VI	4.6	0.49u	4.9	90.2	1.0
		Insoluble Chromium VI	1330	0.49u	1160	115.1	100
		Sulfate by IC	203	61.7	152	92.8	5.0
		Hydrazine	6.3	1.2 u	6.1	103.6	1.0
		Nitrate Nitrite	124	69.6	56.8	98.1	10.0
-002	B13CK9	Cyanide, Total	4.38	0.72u	4.74	92.4	1.0
		Ammonia, as N	196	34.3	184	87.7	1.0
		Sulfide	387	42.9	473	72.7	1.0
BLANK10	01LXC074-MB1	Chloride by IC	23.8	1.2 u	25.0	95.3	1.0
		Fluoride by IC	51.9	2.5 u	50.0	103.9	1.0
		Nitrite by IC	24.2	1.25u	25.0	96.6	1.0
		Nitrate by IC	24.9	1.25u	25.0	99.6	1.0
		Phosphate by IC	26.1	1.2 u	25.0	104.4	1.0
		Sulfate by IC	24.1	1.2 u	25.0	96.3	1.0
BLANK10	01LVI086-MB1	Soluble Chromium VI	4.0	0.40u	4.0	100.9	1.0
		Insoluble Chromium VI	1060	0.40u	1090	96.4	100
BLANK10	01LNZ004-MB1	Hydrazine	5.2	1.0 u	5.0	103.1	1.0
		Hydrazine MSD	5.2	1.0 u	5.0	103.6	1.0
BLANK10	01LN3061-MB1	Nitrate Nitrite	5.2	0.20u	5.0	103.0	1.0
BLANK10	01LAM050-MB1	Ammonia, as N	103	2.5 u	100	102.8	1.0
		Ammonia, as N MSD	103	2.5 u	100	103.2	1.0
BLANK10	01LSDA60-MB1	Sulfide	293	40.0 u	309	94.8	1.0

Lionville Laboratory, Inc.

INORGANICS DUPLICATE SPIKE REPORT 11/16/01

CLIENT: TNU-HANFORD B02-008 H1568/H1571 LVL LOT #: 0111L256

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
BLANK10	01LH8004-MB1	Hydrazine	103.1	103.6	0.46
BLANK10	01LAM050-MB1	Ammonia, as N	102.8	103.2	0.49

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Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 11/16/01

CLIENT: TMU-HANFORD B02-008 H1568/H1571 LVL LOT #: 0111L256
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B13C81	% Solids	82.3	82.6	0.30	1.0
		Chloride by IC	6.6	4.8	32.3	1.0
		Fluoride by IC	3.0 u	3.0 u	NC	1.0
		Nitrite by IC	1.52u	1.52u	NC	1.0
		Nitrate by IC	200	201	0.48	10.0
		Phosphate by IC	1.5 u	1.5 u	NC	1.0
		Chromium VI	0.49u	0.49u	NC	1.0
		Sulfate by IC	61.7	60.5	2.0	1.0
		Hydrazine	1.2 u	1.2 u	NC	1.0
		Nitrate Nitrite	69.6	67.2	3.4	10.0
		pH	8.3	8.4	0.6	1.0
-002REP	B13CK9	Cyanide, Total	0.72u	0.64u	NC	1.0
		Ammonia, as N	34.3	48.6	34.5	1.0
		Sulfide	61.2 u	60.1	~~NC~~ 33.5	1.0

000026

Date: 6 December 2001
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200 Area Source Characterization 200-CS-1 Operable Unit - Waste Management
Subject: Gasoline & Diesel Range Organics - Data Package No. H1568-LLI (SDG No. H1568)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H1568-LLI prepared by Lionville Laboratory, Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
B13C81	10/30/01	Soil	C	See note 1

1-Diesel range organics, motor oil, n-propyl alcohol and ethanol by 8015B.

Data validation was conducted in accordance with the BHI validation statement of work and the *Sampling and Analysis Instruction for the 216-A-29 Ditch for Project W-211,* BHI-01562, Rev. 0, October 2001. Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

- **Holding Times**

  Analytical holding time is assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements is 14 days to extraction and 40 days for analysis.

  All holding times were acceptable.

- **Blanks**

  Method Blanks

  Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the project quantitation limit (PQL) and is less than five times (or less than ten times for lab contaminants) the highest associated blank result, the sample result value is raised to the PQL level and qualified as undetected "U".

  All blank results were acceptable.

  Field Blanks

  No field blanks were submitted for analysis, therefore, no field blank data was available for review.

- **Accuracy**

  Matrix Spike

  Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike recoveries must fall within the range of 70% to 130%. Samples with a spike recovery of less than 25% and a sample result below the instrument detection limit (IDL) are rejected and flagged "UR". Samples with a spike recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a spike recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a spike recovery greater than 130% and a sample result less than the IDL, no qualification is required.

  Due to the lack of a matrix spike analysis, the motor oil result was qualified as estimate and flagged J".

  All matrix spike recovery results were acceptable.

Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If surrogate recoveries are out of control limits (50-100%) or outside laboratory control limits, all associated sample results greater than the target required quantitation limit (PQL) are qualified as estimates and flagged "J". Sample results less than the PQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the PQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

Due to the lack of a surrogate analysis, all n-propyl alcohol and ethanol results were qualified as estimates and flagged "J".

All other surrogate recovery results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All MS/MSD RPD results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against *Sampling and Analysis Instruction for the 216-A-29 Ditch for Project W-211* PQLs to ensure that laboratory detection levels meet the required criteria. All reported results exceeded

the PQL. Under the BHI statement of work, no qualification is required.

- **Completeness**

Data package No. H1568-LLI was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None reported.

MINOR DEFICIENCIES

Due to the lack of a matrix spike analysis, the motor oil result was qualified as estimate and flagged J". Due to the lack of a surrogate analysis, all n-propyl alcohol and ethanol results were qualified as estimates and flagged "J". Data flagged 'J' is an estimate, but under the BHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

All reported results exceeded the PQL. Under the BHI statement of work, no qualification is required.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

BHI-01562, Rev. 0, *Sampling and Analysis Instruction for the 216-A-29 Ditch for Project W-211,* October 2001.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with BHI validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H1568	REVIEWER: TLI	DATE: 12/6/01	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Motor oil	J	All	No MS/MSD
n-Propyl alcohol Ethanol	J	All	No surrogate analysis

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

GASOLINE RANGE ORGANICS ANALYSIS, SOIL MATRIX, (MG/KG) Page__1__ of__1__

Project: BECHTEL-HANFORD															
Laboratory: Lionville Laboratory Inc.															
Case:	SDG: H1568														
Sample Number		B13C81													
Remarks															
Sample Date		10/30/01													
Extraction Date		11/5/01													
Analysis Date		11/5/01													
Gasoline/Diesel Range Organics	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
n-Propyl alcohol	5	6.0	UJ												
Ethanol	5	6.0	UJ												
Diesel range organics	5	14.6	U												
Motor oil	5	14.6	UJ												

0000010

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results. All other qualifiers shown were applied during validation.

Lionville Laboratory, Inc.

GC SCAN

Report Date: 11/09/01 14:14

RFW Batch Number: 0111L256 Client: TMU-HANFORD B02-008 Work Order: 11343606001 Page: 1

	Cust ID:	B13C81	B13C81	B13C81	B13CK9	BLK	BLK BS
Sample Information	RFW#:	001	001 MS	001 MSD	002	01LJMB05-MB1	01LJMB05-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
n-Propyl Alcohol		6.0 U J	86 %	85 %	8.0 U	5.0 U	103 %
Ethanol		6.0 U J	86 %	83 %	8.0 U	5.0 U	99 %

	Cust ID:	BLK BSD
Sample Information	RFW#:	01LJMB05-MB1
	Matrix:	SOIL
	D.F.:	1.00
	Units:	mg/kg
n-Propyl Alcohol		98 %
Ethanol		94 %

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked. %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

0000134

12/3/01

Lionville Laboratory, Inc.
DIESEL RANGE ORGANICS BY GC

Report Date: 11/08/01 13:06

RFW Batch Number: 0111L256 Client: TNU-HANFORD B02-008 Work Order: 11343606001 Page: 1

	Cust ID:	B13C81	B13C81	B13C81	B13CK9	BLK	BLK BS
Sample Information	RFW#:	001	001 MS	001 MSD	002	01LE1331-MB1	01LE1331-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	4.00	1.00	1.00
	Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
	p-Terphenyl	62 % fl	76 % fl	97 % fl	D % fl	38 % fl	52 % fl
Diesel Range Organics		14.6 U	76 %	94 %	73.6 U	12.0 U	63 %
Motor Oil		14.6 U J	NS	NS	760	12.0 U	NS

LK 11-8-01

12/3/01

0000012

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LVLI
LIONVILLE LABORATORY INC.

Analytical Report

Client: THU HANFORD
LVL#: 0111L256

W.O.#: 11343-606-001-9999-00
Date Received: 11-02-01

GC SCAN

The set of samples consisted of two (2) soil samples collected on 10-30-01.

The samples and their associated QC samples were analyzed according to criteria set forth in Lionville Laboratory OPs based on Method 8015B for Gasoline Range Organic (GRO) target compounds Ethanol and n-Propyl Alcohol on 11-05-01.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. The samples were packaged and stored as specified in the method protocol.
2. Surrogates are not currently employed in the methodology.
3. All initial calibrations were within acceptance criteria.
4. All continuing calibrations run prior to analysis were within acceptance criteria.
5. All blank spike recoveries were within acceptance criteria.
6. All matrix spike recoveries were within acceptance criteria.

Jain Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated

11/13/01
Date

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208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

Lionville Laboratory, Inc.
GCSC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B02-008 H1568/H1571

DATE RECEIVED: 11/02/01 LVL LOT # :0111L256

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B13C81	001	S	01LJMB05	10/30/01	11/05/01	11/05/01
B13C81	001 MS	S	01LJMB05	10/30/01	11/05/01	11/05/01
B13C81	001 MSD	S	01LJMB05	10/30/01	11/05/01	11/05/01
B13CK9	002	S	01LJMB05	10/31/01	11/05/01	11/05/01
LAB QC:						
BLK	MB1	S	01LJMB05	N/A	11/05/01	11/05/01
BLK	MB1 BS	S	01LJMB05	N/A	11/05/01	11/05/01
BLK	MB1 BSD	S	01LJMB05	N/A	11/05/01	11/05/01

LIONVILLE LABORATORY INC

Analytical Report

Client: TNU-HANFORD B02-008
LVL#: 0111L256
SDG/SAF#: H1568/H1571/B02-008

W.O.#: 11343-606-001-9999-00
Date Received: 11-02-01

DIESEL RANGE ORGANICS

The set of samples consisted of two (2) soil samples collected on 10-30-01.

The samples and their associated QC samples were prepared on 11-05-01 and analyzed according to Lionville Laboratory OPs based on EPA Method 8015B for Diesel Range Petroleum Hydrocarbons on 11-07-01. The analysis met the intent of method WTPH-D.

1. All cooler temperatures have been recorded on the chain-of-custody.

2. All required holding times for extraction and analysis were met.

3. All initial calibrations associated with this data set were within acceptance criteria.

4. All diesel continuing calibration standards analyzed prior to the sample extracts were within acceptance criteria.

5. All obtainable surrogate recoveries were within acceptance criteria.

6. The blank spike recovery was within acceptance criteria.

7. All matrix spike recoveries were within acceptance criteria.

8. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated

11/13/01
Date

R:\share\dro\11-256.doc

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

Lionville Laboratory, Inc.
DRO ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B02-008 H1568/1571

RFW LOT # :01111256

CLIENT ID	RFW #	MTX	PREP #	COLLECTN DATE	REC	EXT/PREP	ANALYSIS
B13C81	001	S	01LE1331	10/30/01	11/02/01	11/05/01	11/07/01
B13C81	001 MS	S	01LE1331	10/30/01	11/02/01	11/05/01	11/07/01
B13C81	001 MSD	S	01LE1331	10/30/01	11/02/01	11/05/01	11/07/01
B13CK9	002	S	01LE1331	10/31/01	11/02/01	11/05/01	11/07/01
LAB QC:							
BLK	MB1	S	01LE1331	N/A	N/A	11/05/01	11/07/01
BLK	MB1 BS	S	01LE1331	N/A	N/A	11/05/01	11/07/01

LK 11-8-01

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B02-008-01	Page 1 of 1
Collector: Thomas, G/Watson, D	Company Contact: Conrlock, CS	Telephone No.: 372-9638	Project Coordinator: TRENT, SJ	Price Code: ~~8N~~ 8R RT 11-01; Data Turnaround: ~~45 Days~~ 15 Day RT 11-01
Project Designation: 200 Area Source Characterization 200-CS-1 OU - Waste Mass	Sampling Location: 200 East & West		SAF No.: B02-008	Air Quality ☐
Ice Chest No.: See OSPC	Field Logbook No.: EL-1551	COA: XL2002CHGR	Method of Shipment: Fed Ex	
Shipped To: TMA/RECRA	Offsite Property No.: ~~A020018~~ N/A DSW 10/30/01		Bill of Lading/Air Bill No.: SEE OSPC N/A DSW 10/30/01	

POSSIBLE SAMPLE HAZARDS/REMARKS

TIE TO B13C84

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 10/30/01. Collector not available to relinquish samples on 11/1/01 for shipment. RT 11-01

Preservation	~~None~~	None	Cool 4C Cool 4C	Cool 4C Cool 4C	Cool 4C Cool 4C	None	Cool 4C Cool 4C	None		
Type of Container	~~aG~~	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	~~1~~	1	1	1	1	1	1	1		
Volume	~~1000mL~~	500mL	1000mL	1000mL	120mL	60mL	120mL	120mL		
SAMPLE ANALYSIS	~~See item (1) in Special Instructions.~~ DSW 10/30/01	See item (2) in Special Instructions.	See item (3) in Special Instructions.	See item (4) in Special Instructions.	PCBs - 8082	pH (Soil) - 9045	VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	Hydrazine - D1385		

Sample No.	Matrix *	Sample Date	Sample Time										
B13C81	SOIL	10/30/01	0830		X	X	X	X	X	X	X		

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
D Watson / [signature]	10-30-01 1215	REF-1A 3728 BLDG.	10-30-01 1215
Bldg 1A 3728	11-1-01 0900	R Thorey	11-1-01 0900
R Thorey	11-1-01 1100	FED EX	
Fed Ex	11/2/01 0935	V. Hernandez	11/2/01 0935

SPECIAL INSTRUCTIONS

** The laboratory is to report Decane as a TIC if present in detectable quantities.
** The laboratory is to report both diesel and kerosene range compounds from WTPH-D analysis

~~(1) Gross Alpha; Gross Beta; Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Antimony-125, Barium-133, Cerium-134, Curium-242, Radium-226, Radium-228, Sodium-22, Tin-126); Strontium-89,90 - Total Sr; Carbon-14; Total Uranium; Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241; Neptunium-237; Isotopic Uranium~~ DSW 10.30.01

(2) ICP Metals - 6010A (Superfund) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Aluminum, Beryllium, Bismuth, Boron, Calcium, Copper, Iron, Manganese, Molybdenum, Nickel, Potassium, Sodium, Thallium, Vanadium, Zinc); Mercury - 7471 - (CV); Chromium Hex - 7196

(3) NO2/NO3 - 353.2; IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010

(4) Semi-VOA -- 8270A (Add-On) (Tributyl phosphate); TPH-Diesel Range - WTPH-D

Matrix *: S=Soil, SE=Sediment, SO=Solid, SL=Sludge, W=Water, O=Oil, A=Air, DS=Drum Solids, DL=Drum Liquids, T=Tissue, WI=Wipe, L=Liquid, V=Vegetation, X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Appendix 5

Data Validation Supporting Documentation

GENERAL GC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-CS-1			DATA PACKAGE: H1568		
VALIDATOR: TLI		LAB: LCI		DATE: 2Dec01	
CASE:			SDG: H1568		

ANALYSES PERFORMED					
☐ 8010	☒ 8015	☐ 8020	☐ 8021	8140	8141
☐ 8150	☐ 8151	☐ WTPH-HCID	☐ WTPH-G	☐ WTPH-D	☐
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX: B13C81 Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . Yes No (N/A)

Is a case narrative present? . . . . . (Yes) No N/A

Comments: _____

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments: _____

GENERAL GC DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION

3.1 INITIAL CALIBRATION

Was an initial calibration performed? . . . . . Yes No (N/A)

Are %RSD values for calibration or response factors acceptable? . . . . . Yes No (N/A)

Comments:_____

3.2 CONTINUING CALIBRATION

Was a continuing calibration check performed? . . . . . Yes No (N/A)

Are %D values for calibration or response factors acceptable? . Yes No (N/A)

Comments:_____

4. BLANKS

Were laboratory blanks analyzed? . . . . . (Yes) No N/A

Are laboratory blank results acceptable? . . . . . (Yes) No N/A

Were field/trip blanks analyzed? . . . . . Yes (No) N/A

Are field/trip blank results acceptable? . . . . . Yes No (N/A)

Comments:_____

5. ACCURACY

Were surrogates analyzed? . . . . . Yes (No) N/A

Are surrogate recoveries acceptable? . . . . . (Yes) No N/A

Were MS/MSD samples analyzed? . . . . . Yes (No) N/A

Are MS/MSD recoveries acceptable? . . . . . (Yes) No N/A

Were LCS samples analyzed? . . . . . Yes No (N/A)

Are LCS recoveries acceptable? . . . . . Yes No (N/A)

GENERAL GC DATA VALIDATION CHECKLIST

Comments: ethanol + n-propyl alcohol – no surr – J
NOMS – methanol – J

6. PRECISION

Are MS/MSD sample RPD values acceptable? . . . . . (Yes) No N/A
Are field duplicate RPD values acceptable? . . . . . Yes No (N/A)
Are field split RPD values acceptable? . . . . . Yes No (N/A)
Comments:

7. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . Yes No (N/A)
Is compound quantitation acceptable? . . . . . Yes No (N/A)
Comments:

8. REPORTED RESULTS AND DETECTION LIMITS

Are results reported for all requested analyses? . . . . . (Yes) No N/A
Are all results supported in the raw data? . . . . . Yes No (N/A)
Do results meet the CRQLs? . . . . . Yes (No) N/A
Comments: methanol + DRO – over
N-prop + ethanol – over

A-12 000022

Date: 6 December 2001
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200 Area Source Characterization 200-CS-1 Operable Unit - Waste Management
Subject: Radiochemistry - Data Package No. H1568-ES (SDG No. H1568)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H1568-ES prepared by Eberline Services (ES). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
B13C81	10/30/01	Soil	C	See note 1

1-Gross alpha; gross beta; carbon-14; neptunium-237; curium-242; total strontium; americium-241; isotopic uranium, plutonium and thorium; neptunium-237; gamma spectroscopy; total uranium.

Data validation was conducted in accordance with the BHI validation statement of work and the *Sampling and Analysis Instruction for the 216-A-29 Ditch for Project W-211, BHI-01562, Rev. 0,* October 2001. Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Data Requested by Client

DATA QUALITY PARAMETERS

- **Holding Times**

  Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 6 months.

  All holding times were acceptable.

- **Preparation (Method) Blanks**

  Laboratory Blanks

  Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the minimum detectable activity (MDA), the following qualifiers are applied: All positive sample results less than five times the highest blank concentration are qualified as estimates and flagged "J"; sample results below the MDA are qualified as undetected and flagged "U"; sample results above the MDA and greater than five times the highest blank concentration are not qualified.

  Due to the lack of a blank analysis, all americium-241(aea), curium-242, sodium-22, antimony-125, tin-126, cesium-134, and barium-133 results were qualified as estimates and flagged "J".

  All blank results were acceptable.

  Field Blank

  No field blanks were submitted for analysis.

- **Accuracy**

  Accuracy is evaluated from laboratory control sample (LCS) or blank spike sample (BSS) batch samples and spiked samples from the analytical batch. Measured activities are compared to the known added amounts. The acceptable LCS or BSS and matrix spike (MS) recovery range is 70-130% (80-120% for gamma analytes). In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, or not qualified, depending on the activity of the individual sample. Results are rejected for LCS/BSS recoveries of less than 30%, tracer recoveries of less than 20%, and tracer recoveries of greater than 115% for detected results.

  Due to the lack of an LCS, all americium-241(aea) and curium-242 results were qualified as estimates and flagged "J".

  Due to the lack of a matrix spike analysis, all carbon-14 results were qualified as estimates and flagged "J".

  All other accuracy results were acceptable.

- **Laboratory Duplicates**

  Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the PQL and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the PQL, the RPD control limit is less than or equal to two times the PQL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

  All duplicate results were acceptable.

  Field Duplicate

  No field duplicates were submitted for analysis.

- **Detection Levels**

  Reported analytical detection levels are compared against the Sampling and Analysis Instruction for the 216-A-29 Ditch for Project W-211, BHI-01562, Rev. 0, PQLs to ensure that laboratory detection levels meet the required criteria. The europium-154 result was reported above the PQL. Under the BHI statement of work, no qualification is required. All other reported laboratory results were reported at or below the analyte-specific PQL.

- **Completeness**

  Data package No. H1568-ES (SDG No. H1568) was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to the lack of a blank analysis, all americium-241(aea) curium-242, sodium-22, antimony-125, tin-126, cesium-134, and barium-133 results were qualified as estimates and flagged "J". Due to the lack of an LCS, all americium-241(aea) and curium-242 results were qualified as estimates and flagged "J". Due to the lack of a matrix spike analysis, all carbon-14 results were qualified as estimates and flagged "J". Data flagged 'J' is an estimate, but under the BHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

The europium-154 result was reported above the PQL. Under the BHI statement of work, no qualification is required.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

BHI-01562, Rev. 0, *Sampling and Analysis Instruction for the 216-A-29 Ditch for Project W-211,* October 2001.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the BHI statement of work are as follows:

U - Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.

UJ - Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H1568	REVIEWER: TLI	DATE: 12/6/01	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Curium-242 Sodium-22 Antimony-125 Tin-126 Cesium-134 Barium-133 Americium-241(aea)	J	All	No blank analysis
Americium-241(aea) Curium-242	J	All	No LCS analysis
Carbon-14	J	All	No matrix spike analysis

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

RADIOCHEMISTRY ANALYSIS, SOIL MATRIX, (PCi/G)

Project: BECHTEL-HANFORD																	
Laboratory: Eberline Services																	
Case	SDG: H1568																
Sample Number		B13C81															
Remarks																	
Sample Date		10/30/01															
Radiochemistry	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Gross Alpha	10	9.54															
Gross Beta	15	18.3															
Carbon-14		-0.983	UJ														
Total Strontium	1	-0.058	U														
Thorium-228		0.796	U														
Thorium-230		0.660															
Thorium-232	1	0.991															
Total Uranium (ug/g)	1	2.76															
Uranium-233	1	0.774															
Uranium-235	1	0.026															
Uranium-238	1	0.495															
Neptunium-237	1	0.028	U														
Plutonium-238	1	0	U														
Plutonium-239/240	1	0	U														
Curium-242		0	UJ														
Americium-241	1	0.025	UJ														
Sodium-22		U	UJ														
Antimony-125		U	UJ														
Potassium-40		16.0															
Tin-126		U	UJ														
Cobalt-60	0.1	U	U														
Barium-133		U	UJ														
Cesium-134		U	UJ														
Cesium-137	0.5	U	U														
Radium-226		0.788															
Radium-228	0.2	1.11															
Europium 152	0.1	U	U														
Europium 154	0.1	U	U														
Europium 155	0.1	U	U														
Thorium-228 (gamma)		0.954															
Thorium-232 (gamma)		1.11															
Uranium-235 (gamma)		U	U														
Uranium-238 (gamma)		U	U														
Americium-241 (gamma)	1	U	U														

0000340

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results. All other qualifiers shown were applied during validation.

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1568

R111015-01 B13C81

DATA SHEET

SDG 7131 Client/Case no Hanford SDG H1568
Contact Melissa C. Mannion Contract No. 630

Lab sample id R111015-01 Client sample id B13C81
Dept sample id 7131-001 Location/Matrix 200 East & West SOLID
Received 11/02/01 Collected/Weight 10/30/01 08:30 921.5 g
% solids 81.9 Custody/SAF No B02-008-01 B02-008

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	12587-46-1	9.54	3.8	3.7	10		93A
Gross Beta	12587-47-2	18.3	6.2	9.2	15		93B
Carbon 14	14762-75-5	-0.983	2.7	4.7	50	U J	C
Total Strontium	SR-RAD	-0.058	0.14	0.28	1.0	U	SR
Thorium 228	14274-82-9	0.796	0.67	0.89		U	TH
Thorium 230	14269-63-7	0.660	0.53	0.63	1.0		TH
Thorium 232	TH-232	0.991	0.53	0.51	1.0		TH
Total Uranium (ug/g)	7440-61-1	2.76	0.35	0.27	0.10		U_T
Uranium 233	U-233/234	0.774	0.26	0.16	1.0		U
Uranium 235	15117-96-1	0.026	0.052	0.20	1.0	U	U
Uranium 238	U-238	0.495	0.22	0.16	1.0		U
Neptunium 237	13994-20-2	0.028	0.056	0.11	1.0	U	NP
Plutonium 238	13981-16-3	0	0.070	0.27	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.070	0.27	1.0	U	PU
Curium 242	15510-73-3	0	0.052	0.20		U J	TP
Americium 241	14596-10-2	0.025	0.049	0.19	1.0	U J	TP
Sodium 22	13966-32-0	U		0.036		U J	GAM
Antimony 125	14234-35-6	U		0.061		U J	GAM
Potassium 40	13966-00-2	16.0	0.67	0.30			GAM
Tin 126	SN-126	U		0.065		U J	GAM
Cobalt 60	10198-40-0	U		0.033	0.050	U	GAM
Barium 133	13981-41-4	U		0.032		U J	GAM
Cesium 134	13967-70-9	U		0.050		U J	GAM
Cesium 137	10045-97-3	U		0.027	0.10	U	GAM
Radium 226	13982-63-3	0.788	0.061	0.050	0.10		GAM
Radium 228	15262-20-1	1.11	0.15	0.13	0.20		GAM
Europium 152	14683-23-9	U		0.062	0.10	U	GAM
Europium 154	15585-10-1	U		0.11	0.10	U	GAM

200 Area Source Chara. 200-CS-1 OU

12/3/01

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 11/19/01

DATA SHEET, cont

SDG	7131	Client/Case no	Hanford	SDG H1568	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R111015-01	Client sample id	B13C81		
Dept sample id	7131-001	Location/Matrix	200 East & West	SOLID	
Received	11/02/01	Collected/Weight	10/30/01 08:30	921.5 g	
% solids	81.9	Custody/SAF No	B02-008-01	B02-008	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Europium 155	14391-16-3	U		0.081	0.10	U	GAM
Thorium 228	14274-82-9	0.954	0.041	0.036			GAM
Thorium 232	TH-232	1.11	0.15	0.13			GAM
Uranium 235	15117-96-1	U		0.11		U	GAM
Uranium 238	U-238	U		3.9		U	GAM
Americium 241	14596-10-2	U		0.099		U	GAM

200 Area Source Chara. 200-CS-1 OU

12/3/01

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/19/01

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H1568 was composed of one solid (soil) sample designated under SAF No. B02-008 with a Project Designation of: 200 Area Source Characterization 200-CS-1 OU – Waste Management. SDG H1568 (7131) was batched with SDG H1575 (7130) per BHI's permission.

The sample was received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to BHI via e-Fax on November 17 and 19, 2001.

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analyses

No problems were encountered during the course of the analyses.

2.2 Carbon-14 Analyses

The C-14 LCS percent recovery (83%) was below the 3σ limits (86 to 114%), but within the laboratory protocol limits (80 to 120%). No other problems were encountered during the course of the analyses.

2.3 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.4 Isotopic Thorium Analyses

No problems were encountered during the course of the analyses.

2.5 Isotopic Uranium Analyses

No problems were encountered during the course of the analyses.

2.6 Total Uranium Analyses

No problems were encountered during the course of the analyses.

2.7 Neptunium-237 Analyses

No problems were encountered during the course of the reanalyses.

2.8 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

2.9 Transplutonic Analyses (Am-241 and Cm-242)

Due to an oversight sample B13C81was originally only analyzed for Am-241 instead of Am-241 and Cm-242; thus there is only QC data for Am-241. SDG H1575 requested Am-241 only. The Am-241 LCS recovery was 97%. The Am-241 method blank result (0.00 ± 0.053 pCi/g) was below the MDA (0.20 pCi/g). No other problems were encountered during the course of the analyses.

2.10 Gamma Spectroscopy Analyses

No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

Melissa Mannion
Melissa C. Mannion
Program Manager

11/19/01
Date

Bechtel Hanford Inc. | **CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST** | B02-008-01 | Page 1 of 1

Collector: Thomas, G/Watson, D	Company Contact: Cearlock, CS — Telephone No. 372-9638	Project Coordinator: TRENT, SJ	Price Code: 8N 8K — Data Turnaround: ~~45 Days~~ 15 Day
Project Designation: 200 Area Source Characterization 200-CS-1 OU - Waste Mana	Sampling Location: 200 East & West — H1568 (7131)	SAF No.: B02-008	Air Quality ☐
Ice Chest No.: ERC 96-030	Field Logbook No.: EL-1551 — COA: XL2002CHGR	Method of Shipment: Fed Ex	
Shipped To: TMA/RECRA	Offsite Property No.: A020005 A/A DSW 10/30/01	Bill of Lading/Air Bill No.: 4236784-8518 A/A DSW 10/30/01	

POSSIBLE SAMPLE HAZARDS/REMARKS

TIC TO B13C84

RT 11-1-01

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 10.30.01. Collector not available to relinquish samples on 11/01/01 for shipment. RT

SAMPLE ANALYSIS

Preservation	None	None	Cool 4C Cool 4C	Cool 4C Cool 4C	Cool 4C Cool 4C	None	Cool 4C Cool 4C	None
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG
No. of Container(s)	1	1	1	1	1	1	1	1
Volume	1000mL	500mL	1000mL	1000mL	120mL	60mL	120mL	120mL
Sample Analysis	See item (1) in Special Instructions.	See item (2) in Special Instructions.	See item (3) in Special Instructions.	See item (4) in Special Instructions.	PCBs - 8082	pH (Soil) - 9045	VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	Hydrazine - D1385

(Columns 2–8 struck through with a diagonal line: DSW 10/30/01)

Sample No.	Matrix *	Sample Date	Sample Time								
B13C81	SOIL	10/30/01	0830	X							

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DS Watson / [illegible]	10-30-01 RIS	REF. 1A 3728 BLDG.	10-30-01 1215
Ref. 1A 3728	11-1-01 0900	RT [illegible] RThorn	11-1-01 0900
RT [illegible] ERC	11-1-01 0900	FED EX	11-01-01
FED EXPRESS	11-02-01 9:30	[illegible] E. Secundo SCH-2	11-02-01 9:30

SPECIAL INSTRUCTIONS

** The laboratory is to report Decane as a TIC if present in detectable quantities.
** The laboratory is to report both diesel and kerosene range compounds from WTPH-D analysis

(1) Gross Alpha; Gross Beta; Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Antimony-125, Barium-133, Cesium-134, ~~Cesium-135~~, Radium-226, Radium-228, Sodium-22, Tin-126); Strontium-89,90 – Total Sr; Carbon-14; Total Uranium; Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241; Neptunium-237; Isotopic Uranium
(2) ~~ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver)~~; ICP Metals - 6010A (Supertrace Add-On) (Aluminum, Beryllium, Bismuth, Boron, Calcium, Copper, Iron, ~~Manganese, Molybdenum, Nickel, Potassium, Sodium, Thallium, Vanadium, Zinc); Mercury - 7471~~ (CV); Chromium Hex - 7196
(3) NO2/NO3 - 353.2; IC Anions - 300.0 (Chloride, Fluoride, ~~Nitrate, Nitrite, Phosphate, Sulfate~~); ~~Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010~~
(4) ~~Semi-VOA – 8270A (Add-On) (Tributyl phosphate); TPH Diesel Range - WTPH-D~~

DSW 10-30-01

Matrix *: S=Soil, SE=Sediment, SO=Solid, SL=Sludge, W=Water, O=Oil, A=Air, DS=Drum Solids, DL=Drum Liquids, T=Tissue, WI=Wipe, L=Liquid, V=Vegetation, X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (10/99)

0000016

Appendix 5

Data Validation Supporting Documentation

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-ES-1			DATA PACKAGE: #1568		
VALIDATOR: TLI		LAB: EB		DATE: 11/29/01	
CASE:			SDG: #1568		
ANALYSES PERFORMED					
☒ Gross Alpha/Beta	☒ Strontium-90	☐ Technetium-99	☒ Alpha Spectroscopy	☒ Gamma Spectroscopy	
☒ Total Uranium	☐ Radium-22	☒ Tritium	☐		
SAMPLES/MATRIX B13C81				Soil	

1. Completeness . . . . . ☒ N/A

Technical verification forms present? . . . . . Yes No N/A

Comments: _____

2. Initial Calibration . . . . . ☒ N/A

Instruments/detectors calibrated within one year of sample analysis? . . . . . Yes No N/A

Initial calibration acceptable? . . . . . Yes No N/A

Standards NIST traceable? . . . . . Yes No N/A

Standards Expired? . . . . . Yes No N/A

Comments: _____

3. Continuing Calibration . . . . . ☒ N/A

Calibration checked within one week of sample analysis? . . .	Yes	No	N/A
Calibration check acceptable?	Yes	No	N/A
Calibration check standards NIST traceable?	Yes	No	N/A
Calibration check standards expired?	Yes	No	N/A

Comments: _____

4. Blanks . . . . . ☐ N/A

Method blank analyzed?	Yes	(No)	N/A
Method blank results acceptable?	(Yes)	No	N/A
Analytes detected in method blank?	Yes	(No)	N/A
Field blank(s) analyzed?	Yes	(No)	N/A
Field blank results acceptable?	Yes	No	(N/A)
Analytes detected in field blank(s)?	Yes	No	(N/A)
Transcription/Calculation Errors?	Yes	No	(N/A)

Comments: Curium-242, Sodium-22, antimony-125 Tin-126
Cesium-134 Barium-133 Am-241(gea) — no blank J

5. Matrix Spikes . . . . . ☐ N/A

Matrix spike analyzed?	Yes	(No)	N/A
Spike recoveries acceptable?	Yes	No	(N/A)
Spike source traceable?	Yes	No	(N/A)
Spike source expired?	Yes	No	(N/A)
Transcription/Calculation Errors?	Yes	No	(N/A)

Comments: C-14 — no MS J

6. Laboratory Control Samples . . . . . ☐ N/A

LCS analyzed? . . . . . Yes (No) N/A
LCS recoveries acceptable? . . . . . (Yes) No N/A
LCS traceable? . . . . . Yes No (N/A)
Transcription/Calculation Errors? . . . . . Yes No (N/A)

Comments: Am241 (yes) Curium-242 — No LCS J

7. Chemical Recovery . . . . . ☐ N/A

Chemical carrier added? . . . . . (Yes) No N/A
Chemical recovery acceptable? . . . . . (Yes) No N/A
Chemical carrier traceable? . . . . . Yes No (N/A)
Chemical carrier expired? . . . . . Yes No (N/A)
Transcription/Calculation errors? . . . . . Yes No (N/A)

Comments:

8. Duplicates . . . . . ☐ N/A

Duplicates Analyzed? . . . . . (Yes) No N/A
RPD Values Acceptable? . . . . . (Yes) ~~No~~ N/A
Transcription/Calculation Errors? . . . . . Yes ~~No~~ (N/A)

Comments: Europium-152

9. Field QC Samples . . . . . ☒ N/A

Field duplicate sample(s) analyzed?	Yes	No	N/A
Field duplicate RPD values acceptable?	Yes	No	N/A
Field split sample(s) analyzed?	Yes	No	N/A
Field split RPD values acceptable?	Yes	No	N/A
Performance audit sample(s) analyzed?	Yes	No	N/A
Performance audit sample results acceptable?	Yes	No	N/A

Comments:_____

10. Holding Times

Are sample holding times acceptable?	(Yes)	No	N/A

Comments:_____

11. Results and Detection Limits (Levels D & E) . . . . . ☐ N/A

Results reported for all required sample analyses?	(Yes)	No	N/A
Results supported in raw data?	Yes	No	(N/A)
Results Acceptable?	(Yes)	No	N/A
Transcription/Calculation errors?	Yes	No	(N/A)
MDA's meet required detection limits?	Yes	(No)	N/A
Transcription/calculation errors?	Yes	No	(N/A)

Comments: Uranium-154 —

Appendix 6

Additional Documentation Requested by Client

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1568

R111014-07 Method Blank

METHOD BLANK

SDG 7131 Client/Case no Hanford SDG H1568
Contact Melissa C. Mannion Contract No. 630

Lab sample id R111014-07 Client sample id Method Blank
Dept sample id 7130-007 Material/Matrix SOLID
SAF No B02-008

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	12587-46-1	-0.201	1.5	2.9	10	U	93A
Gross Beta	12587-47-2	0.050	3.8	6.4	15	U	93B
Total Strontium	SR-RAD	-0.092	0.13	0.30	1.0	U	SR
Americium 241	14596-10-2	N.A.			1.0		AM
Thorium 228	14274-82-9	0.333	0.53	0.89		U	TH
Thorium 230	14269-63-7	0.133	0.40	0.64	1.0	U	TH
Thorium 232	TH-232	0.133	0.13	0.51	1.0	U	TH
Total Uranium (ug/g)	7440-61-1	0	0.001	0.003	0.10	U	U_T
Uranium 233	U-233/234	0.021	0.042	0.16	1.0	U	U
Uranium 235	15117-96-1	0.025	0.051	0.19	1.0	U	U
Uranium 238	U-238	0	0.042	0.16	1.0	U	U
Neptunium 237	13994-20-2	-0.012	0.024	0.091	1.0	U	NP
Plutonium 238	13981-16-3	0	0.062	0.24	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.062	0.24	1.0	U	PU
Potassium 40	13966-00-2	U		0.13		U	GAM
Cobalt 60	10198-40-0	U		0.008	0.050	U	GAM
Cesium 137	10045-97-3	U		0.008	0.10	U	GAM
Radium 226	13982-63-3	U		0.017	0.10	U	GAM
Radium 228	15262-20-1	U		0.037	0.20	U	GAM
Europium 152	14683-23-9	U		0.022	0.10	U	GAM
Europium 154	15585-10-1	U		0.028	0.10	U	GAM
Europium 155	14391-16-3	U		0.021	0.10	U	GAM
Thorium 228	14274-82-9	U		0.019		U	GAM
Thorium 232	TH-232	U		0.037		U	GAM
Uranium 235	15117-96-1	U		0.029		U	GAM
Uranium 238	U-238	U		0.98		U	GAM
Americium 241	14596-10-2	U		0.026		U	GAM

200 Area Source Chara. 200-CS-1 OU

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 11/19/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1568

R111015-04 Method Blank

METHOD BLANK

SDG 7131	Client/Case no Hanford	SDG H1568	
Contact Melissa C. Mannion	Contract No. 630		
Lab sample id R111015-04	Client sample id Method Blank		
Dept sample id 7131-004	Material/Matrix	SOLID	
	SAF No B02-008		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	-0.331	2.9	4.9	50	U	C

200 Area Source Chara. 200-CS-1 OU

QC-BLANK 40212

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 11/19/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1568

R111014-06

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7131 | Client/Case no Hanford | SDG H1568

Contact Melissa C. Mannion | Case no No. 630

Lab sample id R111014-06 | Client sample id Lab Control Sample

Dept sample id 7130-006 | Material/Matrix SOLID

SAF No 802-008

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Gross Alpha	197	14	3.2	10		93A	200	8.0	98	68-132	70-130
Gross Beta	216	12	9.6	15		93B	218	8.7	99	75-125	70-130
Total Strontium	21.9	0.82	0.23	1.0		SR	21.5	0.86	102	83-117	80-120
Americium 241	N.A.			1.0		AM					80-120
Thorium 230	40.4	2.7	0.32	1.0		TH	40.8	1.6	99	86-114	80-120
Total Uranium (ug/g)	17.9	2.0	0.027	0.10		U_T	16.5	0.66	108	76-124	80-120
Uranium 233	17.5	1.7	0.91	1.0		U	18.6	0.74	94	83-117	80-120
Uranium 235	16.1	1.6	0.21	1.0		U	15.1	0.60	107	81-119	80-120
Uranium 238	19.1	1.8	0.87	1.0		U	20.2	0.81	95	84-116	80-120
Neptunium 237	18.7	0.78	0.053	1.0		NP	19.8	0.79	94	89-111	80-120
Plutonium 238	24.3	2.5	0.22	1.0		PU	24.6	0.98	99	82-118	80-120
Plutonium 239/240	26.7	2.7	0.22	1.0		PU	26.4	1.1	101	82-118	80-120
Cobalt 60	1.27	0.027	0.012	0.050		GAM	1.17	0.047	108	75-125	80-120
Cesium 137	1.51	0.025	0.015	0.10		GAM	1.35	0.054	112	74-126	80-120

200 Area Source Chara. 200-CS-1 OU

QC-LCS 40207

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 11/19/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1568

R111015-03 Lab Control Sample

LAB CONTROL SAMPLE

SDG 7131 Client/Case no Hanford SDG H1568
Contact Melissa C. Mannion Case no No. 630

Lab sample id R111015-03 Client sample id Lab Control Sample
Dept sample id 7131-003 Material/Matrix SOLID
SAF No B02-008

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Carbon 14	9390	94	12	50		C	11300	450	83	86-114	80-120

200 Area Source Chara. 200-CS-1 OU

QC-LCS 40211

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 11/19/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1568

R111015-02

B13C81

DUPLICATE

SDG 7131 | Client/Case no Hanford | SDG H1568

Contact Melissa C. Mannion | Case no No. 630

DUPLICATE	ORIGINAL	
Lab sample id R111015-02	Lab sample id R111015-01	Client sample id B13C81
Dept sample id 7131-002	Dept sample id 7131-001	Location/Matrix 200 East & West SOLID
	Received 11/02/01	Collected/Weight 10/30/01 08:30 921.5 g
% solids 81.9	% solids 81.9	Custody/SAF No B02-008-01 B02-008

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ PROT TOT LIMIT
Gross Alpha	8.66	3.8	4.1	10	J	93A	9.54	3.8	3.7	J	10	98
Gross Beta	21.7	5.7	8.0	15		93B	18.3	6.2	9.2		17	71
Carbon 14	-0.345	2.7	4.6	50	U	C	-0.983	2.7	4.7	U	-	
Total Strontium	-0.026	0.13	0.27	1.0	U	SR	-0.058	0.14	0.28	U	-	
Thorium 228	0.718	0.48	0.57			TH	0.796	0.67	0.89	U	10	164
Thorium 230	0.596	0.60	0.73	1.0	U	TH	0.660	0.53	0.63	J	10	192
Thorium 232	1.31	0.60	0.46	1.0		TH	0.991	0.53	0.51	J	28	105
Total Uranium (ug/g)	2.24	0.30	0.27	0.10		U_T	2.76	0.35	0.27		21	34
Uranium 233	0.824	0.23	0.17	1.0	J	U	0.774	0.26	0.16	J	6	66
Uranium 235	0.241	0.14	0.13	1.0	J	U	0.026	0.052	0.20	U	161	168
Uranium 238	0.596	0.20	0.14	1.0	J	U	0.495	0.22	0.16	J	19	82
Neptunium 237	0	0.059	0.088	1.0	U	NP	0.028	0.056	0.11	U	-	
Plutonium 238	0	0.064	0.24	1.0	U	PU	0	0.070	0.27	U	-	
Plutonium 239/240	0	0.064	0.24	1.0	U	PU	0	0.070	0.27	U	-	
Curium 242	0	0.049	0.19		U	TP	0	0.052	0.20	U	-	
Americium 241	0.047	0.093	0.18	1.0	U	TP	0.025	0.049	0.19	U	-	
Sodium 22	U		0.035		U	GAM	U		0.036	U	-	
Antimony 125	U		0.065		U	GAM	U		0.061	U	-	
Potassium 40	16.3	0.71	0.32			GAM	16.0	0.67	0.30		2	33
Tin 126	U		0.087		U	GAM	U		0.065	U	-	
Cobalt 60	U		0.033	0.050	U	GAM	U		0.033	U	-	
Barium 133	U		0.030		U	GAM	U		0.032	U	-	
Cesium 134	U		0.039		U	GAM	U		0.050	U	-	
Cesium 137	U		0.030	0.10	U	GAM	U		0.027	U	-	
Radium 226	0.879	0.068	0.060	0.10		GAM	0.788	0.061	0.050		11	36
Radium 228	1.04	0.14	0.14	0.20		GAM	1.11	0.15	0.13		7	43
Europium 152	U		0.074	0.10	U	GAM	U		0.062	U	-	
Europium 154	U		0.10	0.10	U	GAM	U		0.11	U	-	

200 Area Source Chara. 200-CS-1 OU

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 11/19/01

DUPLICATE, cont.

SDG 7131		Client/Case no Hanford	SDG H1568
Contact Melissa C. Mannion		Case no No. 630	
DUPLICATE	ORIGINAL		
Lab sample id R111015-02	Lab sample id R111015-01	Client sample id B13C81	
Dept sample id 7131-002	Dept sample id 7131-001	Location/Matrix 200 East & West	SOLID
	Received 11/02/01	Collected/Weight 10/30/01 08:30	921.5 g
% solids 81.9	% solids 81.9	Custody/SAF No B02-008-01	B02-008

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALIFIERS	RPD %	3σ PROT TOT LIMIT
Europium 155	U		0.19	0.10	U	GAM	U		0.081	U	-	
Thorium 228	0.999	0.042	0.041			GAM	0.954	0.041	0.036		5	33
Thorium 232	1.04	0.14	0.14			GAM	1.11	0.15	0.13		7	43
Uranium 235	U		0.13		U	GAM	U		0.11	U	-	
Uranium 238	U		3.9		U	GAM	U		3.9	U	-	
Americium 241	U		0.24		U	GAM	U		0.099	U	-	

200 Area Source Chara. 200-CS-1 OU

QC-DUP#1 40252, 40210

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 11/19/01

Date: 6 December 2001
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200 Area Source Characterization 200-CS-1 Operable Unit - Waste Management
Subject: Volatile - Data Package No. H1568-LLI (SDG No. H1568)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H1568-LLI prepared by Lionville Laboratory, Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
B13C81	10/30/01	Soil	C	Volatiles by 8260A

Data validation was conducted in accordance with the BHI validation statement of work and the *Sampling and Analysis Instruction for the 216-A-29 Ditch for Project W-211,* BHI-01562, Rev. 0, October 2001. Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

- **Holding Times**

  Analytical holding times are assessed to ascertain whether the holding time requirements were met by the laboratory. Preserved water samples must be analyzed within 14 days of the date of sample collection for VOAs. If holding times are exceeded, but not by greater than twice the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than twice the limit, all associated detected sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were met.

- **Blanks**

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples of a given matrix. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the project quantitation limit (PQL) and is less than five times (or less than ten times for laboratory contaminants) the highest associated blank result, the sample result value is raised to the PQL, qualified as undetected and flagged "U".

Due to method blank contamination, the methylene chloride result was qualified as undetected and flagged "U".

All other method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis, therefore, no field blank data was available for review.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using the target compounds for which percent recoveries must be within established laboratory quality control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

All matrix spike/matrix spike duplicate recovery results were acceptable.

Surrogate Recovery

The analysis of surrogate compounds provides a measure of system performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory program. When a surrogate compound recovery is out of the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Undetected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Samples with surrogate recoveries less than ten percent are qualified as estimates and flagged "J" for detects, and rejected and flagged "UR" for nondetects. Undetected compounds with surrogate recoveries greater than the upper control limit require no qualification. Surrogates are not required for formaldehyde analysis.

All surrogate recovery results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. For samples analyzed using SW-846 protocol, results must be within RPD limits of +/-35% for solid samples. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All precision results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the *Sampling and Analysis Instruction for the 216-A-29 Ditch for Project W-211,* October 2001 PQLs to ensure that laboratory detection levels meet the required criteria. All undetected analytes had reported analytical detection levels above the analyte specific PQL. Under the BHI validation SOW, no qualification is required.

- **Completeness**

Data package No. H1568-LLI was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to laboratory blank contamination, all methylene chloride results were qualified as undetected and flagged "U".

All undetected had reported analytical detection levels above the analyte specific PQL. Under the BHI validation SOW, no qualification is required.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

BHI-01562, Rev. 0, *Sampling and Analysis Instruction for the 216-A-29 Ditch for Project W-211,* October 2001.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validator in compliance with the BHI validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H1568	REVIEWER: TLI	DATE: 12/6/01	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Methylene chloride	U	All	Blank comtamination

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

VOLATILE ORGANIC , ANALYSIS, SOIL MATRIX, (UG/KG)

Project: BECHTEL-HANFORD															
Laboratory: LLI															
Case:	SDG: H1568														
Sample Number		B13C81													
Remarks															
Sample Date		10/30/01													
Analysis Date		11/10/01													
VOA	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	12	U												
Bromomethane	10	12	U												
Vinyl Chloride	10	12	U												
Chloroethane	10	12	U												
Methylene Chloride	5	12	U												
Acetone	20	12	U												
Carbon Disulfide		6	U												
1,1-Dichloroethene	10	6	U												
1,1-Dichloroethane	10	6	U												
1,2-Dichloroethene (total)	5	6	U												
Chloroform	5	6	U												
1,2-Dichloroethane	5	6	U												
2-Butanone	10	12	U												
1,1,1-Trichloroethane	5	6	U												
Carbon Tetrachloride	5	6	U												
Bromodichloromethane	5	6	U												
1,2-Dichloropropane	5	6	U												
cis-1,3-Dichloropropene	5	6	U												
Trichloroethene	5	6	U												
Dibromochloromethane	5	6	U												
1,1,2-Trichloroethane	5	6	U												
Benzene		6	U												
trans-1,3-Dichloropropene	5	6	U												
Bromoform	5	6	U												
4-Methyl-2-pentanone		12	U												
2-Hexanone		12	U												
Tetrachloroethene	5	6	U												
1,1,2,2-Tetrachloroethane	5	6	U												
Toluene	5	6	U												
Chlorobenzene	5	6	U												
Ethylbenzene		6	U												
Styrene		6	U												
Xylenes (total)	5	6	U												

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize mis-interpretation of results. All other qualifiers shown were applied during validation.

Lionville Laboratory, Inc.
Volatiles by GC/MS, HSL List

RFW Batch Number: 0111L256 Client: TNU-HANFORD B02-008 Work Order: 11343606001 Page: 1a

Report Date: 11/21/01 14:01

	Cust ID:	B13C81	B13C81	B13C81	B13CK9	B13CK9	VBLKYQ
Sample Information	RFW#:	001	001 MS	001 MSD	002	002	01LVH475-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	0.980	1.02	0.962	1.00	1.04	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg REPREP	ug/Kg
Surrogate Recovery	Toluene-d8	105 %	98 %	98 %	145 * %	152 * %	106 %
	Bromofluorobenzene	83 %	84 %	81 %	66 %	69 %	92 %
	1,2-Dichloroethane-d4	88 %	77 %	80 %	116 %	135 %	102 %
Chloromethane		12 U	12 U	12 U	15 U	16 U	10 U
Bromomethane		12 U	12 U	12 U	15 U	16 U	10 U
Vinyl Chloride		12 U	12 U	12 U	15 U	16 U	10 U
Chloroethane		12 U	12 U	12 U	15 U	16 U	10 U
Methylene Chloride		12 B U	12 B	12 B	65 B	78 B	7
Acetone		12 U	12 U	12 U	15 U	16 U	10 U
Carbon Disulfide		6 U	6 U	6 U	8 U	8 U	5 U
1,1-Dichloroethene		6 U	76 %	78 %	8 U	8 U	5 U
1,1-Dichloroethane		6 U	6 U	6 U	8 U	8 U	5 U
1,2-Dichloroethene (total)		6 U	6 U	6 U	8 U	8 U	5 U
Chloroform		6 U	6 U	6 U	8 U	8 U	5 U
1,2-Dichloroethane		6 U	6 U	6 U	12	13	5 U
2-Butanone		12 U	12 U	12 U	15 U	16 U	10 U
1,1,1-Trichloroethane		6 U	6 U	6 U	8 U	8 U	5 U
Carbon Tetrachloride		6 U	6 U	6 U	8 U	8 U	5 U
Bromodichloromethane		6 U	6 U	6 U	8 U	8 U	5 U
1,2-Dichloropropane		6 U	6 U	6 U	8 U	8 U	5 U
cis-1,3-Dichloropropene		6 U	6 U	6 U	8 U	8 U	5 U
Trichloroethene		6 U	102 %	105 %	8 U	8 U	5 U
Dibromochloromethane		6 U	6 U	6 U	8 U	8 U	5 U
1,1,2-Trichloroethane		6 U	6 U	6 U	8 U	8 U	5 U
Benzene		6 U	92 %	96 %	8 U	8 U	5 U
Trans-1,3-Dichloropropene		6 U	6 U	6 U	8 U	8 U	5 U
Bromoform		6 U	6 U	6 U	8 U	8 U	5 U
4-Methyl-2-pentanone		12 U	12 U	12 U	15 U	16 U	10 U
2-Hexanone		12 U	12 U	12 U	15 U	16 U	10 U
Tetrachloroethene		6 U	6 U	6 U	7 J	6 J	5 U
1,1,2,2-Tetrachloroethane		6 U	6 U	6 U	8 U	8 U	5 U
Toluene		6 U	100 %	102 %	8 U	8 U	5 U

*= Outside of EPA CLP QC limits.

000071

RFW Batch Number: 0111L256 Client: TMU-HANFORD B02-008 Work Order: 11343606001 Page: 1b

Cust ID:	B13C81	B13C81	B13C81	B13CK9	B13CK9	VBLKYQ
RFW#:	001	001 MS	001 MSD	002	002 REPREP	01LVH475-MB1
Chlorobenzene	6 U	98 %	101 %	8 U	8 U	5 U
Ethylbenzene	6 U	6 U	6 U	8 U	8 U	5 U
Styrene	6 U	6 U	6 U	8 U	8 U	5 U
Xylene (total)	6 U	6 U	6 U	8 U	8 U	5 U

*= Outside of EPA CLP QC limits.

12/3/01

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Client: TNU-HANFORD B02-008
LVL #: 0111L256
SDG/SAF #: H1568, H1571/B02-008

W.O. #: 11343-606-001-9999-00
Date Received: 11-02-2001

GC/MS VOLATILE

Two (2) water samples were collected on 10-30,31-2001.

The samples and their associated QC samples were analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8260A for TCL Volatile target compounds on 11-10,12-2001.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. The cooler temperatures upon receipt have been recorded on the chain-of-custody.

2. Samples were analyzed within required holding time.

3. Non-target compounds were not detected in the samples.

4. Two (2) of twenty-seven (27) surrogate recoveries were outside EPA QC limits. The out of criteria sample B13CK9 was reanalyzed on 11-12-2001 and reported.

5. All matrix spike recoveries were within EPA QC limits.

6. All blank spike recoveries were within EPA QC limits.

7. The method blanks contained the common laboratory contaminant Methylene Chloride at levels less than 2x the CRQL.

8. Internal standard area criteria were not met for sample B13CK9. The out of criteria sample B13CK9 was reanalyzed on 11-12-2001 and reported.

9. A spectral search was performed for Decane; however, it was not detected in the samples.

10. "I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

J. Michael Taylor
President
Lionville Laboratory Incorporated

11/21/01
Date

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Bechtel Hanford Inc. | B02-008-01 | Page 1 of 1

Collector: Thomas, G/Watson, D	Company Contact: Conrlock, CS — Telephone No. 372-9638	Project Coordinator: TRENT, SJ	Price Code: 8K (8N struck, ZT 11-1-01)
Project Designation: 200 Area Source Characterization 200-CS-1 OU - Waste Mass	Sampling Location: 200 East & West	SAF No. B02-008	Air Quality ☐ — Data Turnaround: ~~45 Days~~ 15 Day ZT 11-1
Ice Chest No. See OSPC	Field Logbook No. EL-1551 — COA XL2002CHGR	Method of Shipment: Fed Ex	
Shipped To: TMS/RECRA	Offsite Property No. A020018 A/A DSW 10/30/01	Bill of Lading/Air Bill No. See OSPC A/A DSW 10/30/01	

POSSIBLE SAMPLE HAZARDS/REMARKS

TIE TO B13C84

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 10/30/01. Collector not available to relinquish samples on 11/1/01 for shipment. ZT 11-1-01

000015

SAMPLE ANALYSIS

Preservation			None	None	Cool 4C Cool 4C	Cool 4C Cool 4C	Cool 4C Cool 4C	None	Cool 4C Cool 4C	None
Type of Container			aG	aG	aG	aG	aG	aG	aG	aG
No. of Container(s)			1	1	1	1	1	1	1	1
Volume			1000mL	500mL	1000mL	1000mL	120mL	60mL	120mL	120mL
			See item (1) in Special Instructions. (struck: DSW 10/30/01)	See item (2) in Special Instructions.	See item (3) in Special Instructions.	See item (4) in Special Instructions.	PCBs - 8082	pH (Soil) - 9045	VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	Hydrazine - D1385
Sample No.	**Matrix ***	**Sample Date**	**Sample Time**							
B13C81	SOIL	10/30/01	0830		X	X	X	X	X	X	X

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From: D Watson / [signature]	10-30-01 1215	Received By/Stored In: REF-1A 3728 Bldg.	10-30-01 1215
Relinquished By/Removed From: Ref 1A 3728	11-1-01 0900	Received By/Stored In: R. Thore	11-1-01 0900
Relinquished By/Removed From: [signature] RECRA	11-1-01 0900	Received By/Stored In: Fed Ex	Date/Time
Relinquished By/Removed From: Fed Ex	11/2/01 0935	Received By/Stored In: [signature]	11/2/01 0935
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

** The laboratory is to report Decane as a TIC if present in detectable quantities.
** The laboratory is to report both diesel and kerosene range compounds from WTPH-D analysis

(1) ~~Gross Alpha, Gross Beta, Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Antimony-125, Barium-133, Cesium-134, Curium-242, Radium-226, Radium-228, Sodium-22, Tin-126); Strontium-89,90 - Total Sr; [illegible]; Total Uranium; Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241; Neptunium-237; Isotopic Uranium~~ DSW 10-30-01
(2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Aluminum, Beryllium, Bismuth, Boron, Calcium, Copper, Iron, Manganese, Molybdenum, Nickel, Potassium, Sodium, Thallium, Vanadium, Zinc); Mercury - 7471 - (CV); Chromium Hex - 7196
(3) NO2/NO3 - 353.2; IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010
(4) Semi-VOA -- 8270A (Add-On) (Tributyl phosphate); TPH-Diesel Range - WTPH-D

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (10/00)

Lionville Laboratory, Inc.
VOA ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B02-008

DATE RECEIVED: 11/02/01 LVL LOT # :0111L256

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B13C81	001	S	01LVH475	10/30/01	N/A	11/10/01
B13C81	001 MS	S	01LVH475	10/30/01	N/A	11/10/01
B13C81	001 MSD	S	01LVH475	10/30/01	N/A	11/10/01
B13CK9	002	S	01LVH475	10/31/01	N/A	11/10/01
B13CK9	002 R1	S	01LVH478	10/31/01	N/A	11/12/01

LAB QC:

VBL

VBLKYQ	MB1	S	01LVH475	N/A	N/A	11/10/01
VBLKYQ	MB1 BS	S	01LVH475	N/A	N/A	11/10/01
VBLKZG	MB1	S	01LVH478	N/A	N/A	11/12/01
VBLKZG	MB1 BS	S	01LVH478	N/A	N/A	11/12/01

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	(C)	D	E
PROJECT: 200-CS-1			DATA PACKAGE: H1568		
VALIDATOR: TH		LAB: LLI		DATE: 1 Dec 01	
CASE:			SDG: H1568		

ANALYSES PERFORMED

☐ CLP Volatiles	☒ SW-846 8240 (cap column)	☐ SW-846 8260 (packed column)	☐ CLP Semivolatiles	☐ SW-846 8270 (cap column)	☐ SW-846 (packed column)
☐	☒	☐	☐	☐	☐

SAMPLES/MATRIX B13C81 Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . Yes No (N/A)

Is a case narrative present? . . . . . (Yes) No N/A

Comments: _____

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments: _____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

Is the GC/MS tuning/performance check acceptable?	Yes	No	N/A
Are initial calibrations acceptable?	Yes	No	N/A
Are continuing calibrations acceptable?	Yes	No	N/A

Comments:

4. BLANKS

Were laboratory blanks analyzed?	Yes	No	N/A
Are laboratory blank results acceptable?	Yes	No	N/A
Were field/trip blanks analyzed?	Yes	No	N/A
Are field/trip blank results acceptable?	Yes	No	N/A

Comments: Methylene Chloride – Lab

5. ACCURACY

Were surrogates/System Monitoring Compounds analyzed?	Yes	No	N/A
Are surrogate/System Monitoring Compound recoveries acceptable?	Yes	No	N/A
Were MS/MSD samples analyzed?	Yes	No	N/A
Are MS/MSD results acceptable?	Yes	No	N/A

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

6. PRECISION

Are MS/MSD RPD values acceptable? . . . . . (Yes) No N/A
Are field duplicate RPD values acceptable? . . . . . Yes No (N/A)
Are field split RPD values acceptable? . . . . . Yes No (N/A)
Comments:

7. SYSTEM PERFORMANCE

Were internal standards analyzed? . . . . . Yes No (N/A)
Are internal standard areas acceptable? . . . . . Yes No N/A
Are internal standard retention times acceptable? . . . . . Yes No N/A
Comments:

8. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . Yes No (N/A)
Is compound quantitation acceptable? . . . . . Yes No N/A
Comments:

9. REPORTED RESULTS AND QUANTITATION LIMITS

Are results reported for all requested analyses? . . . . . (Yes) No N/A
Are all results supported in the raw data? . . . . . Yes No (N/A)
Do results meet the CRQLs? . . . . . Yes (No) N/A
Has the laboratory properly identified and coded all TIC? . . . Yes No (N/A)
Comments: all undetects are

Date: 6 December 2001
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200 Area Source Characterization 200-CS-1 Operable Unit - Waste Management
Subject: PCB - Data Package No. H1568-LLI (SDG No. H1568)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H1568-LLI prepared by Lionville Laboratory, Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
B13C81	10/30/01	Soil	C	PCBs by 8082

Data validation was conducted in accordance with the BHI validation statement of work and the *Sampling and Analysis Instruction for the 216-A-29 Ditch for Project W-211,* BHI-01562, Rev. 0, October 2001. Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

- **Holding Times**

  Analytical holding times for PCB analysis is assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements is 14 days to extraction and 40 days for analysis.

  All holding times were acceptable.

- **Blanks**

  Method Blanks

  Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration greater than project quantitation limit (PQL). If target compounds are present, sample results less than five times the blank concentration are qualified as undetected and flagged "U". If the sample result is less than five times the blank concentration and less than PQL, the result is qualified as undetected and elevated to the PQL.

  All method blank results were acceptable.

  Field Blanks

  No field blanks were submitted for analysis, therefore, no field blank data was available for review.

- **Accuracy**

  Matrix Spike

  Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike analyses are performed in duplicate and must be within control limits of 50% to 150%. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Nondetected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

  All matrix spike recovery results were acceptable.

  Surrogate Recovery

  The analysis of surrogate compounds provides a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory. When a surrogate compound recovery is outside the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Nondetected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated

detection limit and flagged "UJ". Nondetected compounds with surrogate recoveries above the upper control limit require no qualification.

All surrogate recovery results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-35%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All MS/MSD results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the BHI-01562, Rev. 0, *Sampling and Analysis Instruction for the 216-A-29 Ditch for Project W-211,* October 2001 PQLs to ensure that laboratory detection levels meet the required criteria. All PCB results exceeded the PQL. Under the BHI statement of work, no qualification is required.

- **Completeness**

Data package No. H1568-LLI was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

All PCB results exceeded the PQL. Under the BHI statement of work, no qualification is required.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

BHI-01562, Rev. 0, *Sampling and Analysis Instruction for the 216-A-29 Ditch for Project W-211,* October 2001.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with BHI validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H1568	REVIEWER: TLI	DATE: 12/6/01	PAGE 1 OF 1
COMMENTS: No qualifiers assigned.			

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

PCB ANALYSIS, SOIL MATRIX, (UG/KG)

Project: BECHTEL-HANFORD															
Laboratory: Lionville Laboratory Inc.															
Case:	SDG: H1568														
Sample Number		B13C81													
Remarks															
Sample Date		10/30/01													
Extraction Date		11/5/01													
Analysis Date		11/10/01													
PCB	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aroclor-1016	20	40	U												
Aroclor-1221	20	81	U												
Aroclor-1232	20	40	U												
Aroclor-1242	20	40	U												
Aroclor-1248	20	40	U												
Aroclor-1254	20	40	U												
Aroclor-1260	20	40	U												

000010

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results. All other qualifiers shown were applied during validation.

Lionville Laboratory, Inc.

PCBs by GC

Report Date: 11/13/01 12:23

RFW Batch Number: 0111L256 Client: TNU-HANFORD B02-008 Work Order: 11343606001 Page: 1

	Cust ID:	B13C81	B13C81	B13C81	B13CK9	PBLKVD	PBLKVD BS
Sample Information	RFW#:	001	001 MS	001 MSD	002	01LE1330-MB1	01LE1330-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	50.0	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate: Tetrachloro-m-xylene		85 %	68 %	62 %	D %	92 %	95 %
Decachlorobiphenyl		84 %	82 %	92 %	D %	91 %	93 %
Aroclor-1016		40 U	40 U	40 U	2600 U	33 U	33 U
Aroclor-1221		81 U	81 U	81 U	5100 U	67 U	67 U
Aroclor-1232		40 U	40 U	40 U	2600 U	33 U	33 U
Aroclor-1242		40 U	40 U	40 U	2600 U	33 U	33 U
Aroclor-1248		40 U	40 U	40 U	2600 U	33 U	33 U
Aroclor-1254		40 U	89 %	90 %	9400	33 U	89 %
Aroclor-1260		40 U	40 U	40 U	2600 U	33 U	33 U

	Cust ID:	PBLKVD BSD
Sample Information	RFW#:	01LE1330-MB1
	Matrix:	SOIL
	D.F.:	1.00
	Units:	UG/KG
Surrogate: Tetrachloro-m-xylene		92 %
Decachlorobiphenyl		90 %
Aroclor-1016		33 U
Aroclor-1221		33 U
Aroclor-1232		33 U
Aroclor-1242		33 U
Aroclor-1248		33 U
Aroclor-1254		81 %
Aroclor-1254		81 %
Aroclor-1260		33 U

12/3/01

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked. %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

11/13/01

0000011

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LVLI
LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU HANFORD B02-008
LVL#: 0111L256
SDG/SAF#: H1568/H1571/B02-008

W.O.#: 11343-606-001-9999-00
Date Received: 11-02-01

PCB

The set of samples consisted of two (2) soil samples collected on 10-30,31-01.

The samples and their associated QC samples were extracted on 11-05-01 and analyzed according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures on 11-09,10,12-01. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8082 for Aroclors only.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. All cooler temperatures have been recorded on the chain-of-custody.
2. All required holding times for extraction and analysis have been met.
3. The samples and their associated QC samples received a sulfuric acid and a sulfur cleanup.
4. The method blank was below the reporting limits for all target compounds.
5. All obtainable surrogate recoveries were within acceptance criteria.
6. All blank spike recoveries were within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. Sample B13CK9 required a fifty-fold instrument dilution due to the high concentrations of target analytes. Reporting limits have been adjusted to reflect the necessary dilutions.
9. All initial calibrations associated with this data set were within acceptance criteria.
10. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
11. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated

11/14/01
Date

pef\r:\group\data\pest\11L-256.pcb

000013

Lionville Laboratory, Inc.
PCB ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B02-008 H1508/H1571

DATE RECEIVED: 11/02/01 LVL LOT # :0111L256

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B13C81	001	S	01LE1330	10/30/01	11/05/01	11/10/01
B13C81	001 MS	S	01LE1330	10/30/01	11/05/01	11/10/01
B13C81	001 MSD	S	01LE1330	10/30/01	11/05/01	11/10/01
B13CK9	002	S	01LE1330	10/31/01	11/05/01	11/12/01
LAB QC:						
PBLKVD	MB1	S	01LE1330	N/A	11/05/01	11/09/01
PBLKVD	MB1 BS	S	01LE1330	N/A	11/05/01	11/09/01
PBLKVD	MB1 BSD	S	01LE1330	N/A	11/05/01	11/09/01

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B02-008-01 | Page 1 of 1

Collector: Thomas, G/Watson, D	Company Contact: Cearlock, CS	Telephone No.: 372-9638	Project Coordinator: TRENT, SJ
Project Designation: 200 Area Source Characterization 200-CS-1 OU - Waste Mana	Sampling Location: 200 East & West		SAF No.: B02-008
Ice Chest No.: See COC	Field Logbook No.: EL-1551	COA: XL2002CHOR	Method of Shipment: Fed Ex
Shipped To: TRES/RECRA	Offsite Property No.: A/A		Bill of Lading/Air Bill No.: See COC A/A

Price Code: 8N / 8R | Data Turnaround: 45 Days / 15 Days | Air Quality ☐

POSSIBLE SAMPLE HAZARDS/REMARKS

TIE TO B13C84

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 10/30/01. Collector not available to relinquish samples on 11/1/01 for shipment.

SAMPLE ANALYSIS

Preservation	None	None	Cool 4C Cool 4C	Cool 4C Cool 4C	Cool 4C Cool 4C	None	Cool 4C Cool 4C	None		
Type of Container	sG	sG	sG	sG	sG	sG	sG	sG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	1000mL	500mL	1000mL	1000mL	120mL	60mL	120mL	120mL		
	See Item (1) in Special Instructions.	See Item (2) in Special Instructions.	See Item (3) in Special Instructions.	See Item (4) in Special Instructions.	PCBs - 8082	pH (Soil) - 9045	VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	Hydrazine - D1385		

Sample No.	Matrix*	Sample Date	Sample Time									
B13C81	SOIL	10/30/01	0830		X	X	X	X	X	X	X	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DSwatson/[illegible]	10 30 01 1215	REF-1A 3728Bldg.	10-30-01 1215
Relinquished By/Removed From: Bldg 1A 3728	Date/Time: 11-1-01 0900	Received By/Stored In: REF-1A Thorc	Date/Time: 11-1-01 0900
Relinquished By/Removed From: REF-1A THORC	Date/Time: 11-1-01 0900	Received By/Stored In: FEDEX	Date/Time
Relinquished By/Removed From: Fed Ex	Date/Time: 11/2/01 0935	Received By/Stored In: V. Hennessy	Date/Time: 11/2/01 0935
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

** The laboratory is to report Decane as a TIC if present in detectable quantities.
** The laboratory is to report both diesel and kerosene range compounds from WTPH-D analysis

(1) Gross Alpha; Gross Beta; Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Antimony-125, Barium-133, Cesium-134, Curium-242, Radium-226, Radium-228, Sodium-22, Tin-1261; Strontium-89,90 - Total Sr; Carbon-14; Total Uranium; Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241; Neptunium-237; Isotopic Uranium — DSW 10.30.01
(2) ICP Metals - 6010A (Superfund) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Superfund Add-On) (Aluminum, Beryllium, Bismuth, Boron, Calcium, Copper, Iron, Manganese, Molybdenum, Nickel, Potassium, Sodium, Thallium, Vanadium, Zinc); Mercury - 7471 - (CV); Chromium Hex - 7196
(3) NO2/NO3 - 353.2; IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010
(4) Semi-VOA – 8270A (Add-On) (Tributyl phosphate); TPH-Diesel Range - WTPH-D

Matrix*: S=Soil; SD=Sediment; SI=Solid; SW=Sludge; W=Water; O=Oil; A=Air; DS=Drum Solids; DL=Drum Liquids; T=Tissue; WP=Wipe; L=Liquid; V=Vegetation; O=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (10/99)

Appendix 5

Data Validation Supporting Documentation

PESTICIDE/PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-CS-1			DATA PACKAGE: H1568		
VALIDATOR: TL		LAB: LLI		DATE: 1Dec01	
CASE:			SDG: H1568		
ANALYSES PERFORMED					
☐ CLP3/90	☐ SW-846 8080	☐ SW-846 8081	☒ 8082	☐	☐
SAMPLES/MATRIX	B13C81		Soil		

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . Yes No (N/A)

Is a case narrative present? . . . . . (Yes) No N/A

Comments: _____

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments: _____

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

3.1 INSTRUMENT PERFORMANCE (METHOD 8080 AND 8081)

Are DDT retention times acceptable . . . . . Yes No (N/A)

Are calibration standard retention times acceptable? . . . . . Yes No (N/A)

Are DDT and endrin breakdowns acceptable? . . . . . Yes No (N/A)

PESTICIDE/PCB DATA VALIDATION CHECKLIST

Are retention times acceptable in the PEMs, INDA and INDB mixes?	Yes	No	N/A
Are RPD values in the PEMs acceptable?	Yes	No	N/A
Are the DDT and endrin breakdowns acceptable?	Yes	No	N/A
Was GPC cleanup performed?	Yes	No	N/A
Is the GPC calibration check acceptable?	Yes	No	N/A
Was Florisil cleanup performed?	Yes	No	N/A
Is the Florisil performance check acceptable?	Yes	No	N/A

Comments:_____

4. BLANKS

Were laboratory blanks analyzed?	Yes	No	N/A
Are laboratory blank results acceptable?	Yes	No	N/A
Were field/trip blanks analyzed?	Yes	No	N/A
Are field/trip blank results acceptable?	Yes	No	N/A

Comments:_____

5. ACCURACY

Were surrogates analyzed?	Yes	No	N/A
Are surrogate recoveries acceptable?	Yes	No	N/A
Were MS/MSD samples analyzed?	Yes	No	N/A
Are MS/MSD results acceptable?	Yes	No	N/A
Were LCS samples analyzed?	Yes	No	N/A
Are LCS results acceptable?	Yes	No	N/A

Comments:_____

PESTICIDE/PCB DATA VALIDATION CHECKLIST

6. PRECISION

Are MS/MSD RPD values acceptable? . . . . . (Yes) No N/A
Are laboratory duplicate results acceptable? . . . . . (Yes) No N/A
Are field duplicate RPD values acceptable? . . . . . Yes (No) (N/A)
Are field split RPD values acceptable? . . . . . Yes (No) (N/A)
Comments:_____

7. SYSTEM PERFORMANCE

Is chromatographic performance acceptable? . . . . . Yes No (N/A)
Are positive results resolved acceptably? . . . . . Yes No (N/A)
Comments:_____

8. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . Yes No (N/A)
Is compound quantitation acceptable? . . . . . Yes No (N/A)
Comments:_____

9. REPORTED RESULTS AND QUANTITATION LIMITS

Are results reported for all requested analyses? . . . . . (Yes) No N/A
Are all results supported in the raw data? . . . . . Yes No (N/A)
Do results meet the CRQLs? . . . . . Yes (No) N/A
Comments: all over